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BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

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SUMMARY OF RECENT ABSTRACTS.*

IX. LEPROSY.

Epidemiology.

In the epidemiology of leprosy stress is once more laid by several authors on the importance of contact and especially of family contact. Climatic conditions also appear to be significant in determining incidence, but it may be reasonable to ask whether or not the importance of climate is that it largely controls soil fertility and therefore population density: in other words it may lead to increased contact. Racial susceptibility also appears to be a considerable factor.

RADNA (p. 1022) considers that family contact constitutes the greatest danger in leprosy; infection transmitted by insects is possible but at most must be rare, and although hereditary transmission cannot be denied it must be very exceptional. The principal danger is from the discharge of bacilli from the nose and skin, but they may escape through the genito-urinary apparatus, in milk, tears and stool. DOULL (p. 533) has investigated the effect of household exposure to leprosy among 8,007 individuals of 1,051 families in the Philippines, on the basis of person-years of experience. The attack rates averaged 1·3 per 1,000 person-years in those with house contact of one month or more, and the maximum rate of 4·1 was found between the ages of 10 and 14. The annual risk of contracting the disease is 5·1 with contact and 0·9 without, and is again highest in children of 10 to 14. The rate in exposed persons was 5·0 in males and 4·1 in females. No account was taken of the duration of house contact or of the type of case. KOESLAN (p. 236) has estimated the relative degrees of contact experienced in families, work and play circles and village communities in Java and shows that the incidence of leprosy varies directly with the intimacy and duration of contact. In the Panama Republic COURTNEY (p. 1016) has traced a history of contact in 74 per cent. of the patients in the Palo Seco Colony, and even more in new cases. The disease appears to be familial and the author considers inherited predisposition and prolonged intimate contact to be the factors

* The information from which this series of summaries has been compiled is given in the abstracts made by the Sectional Editors in the *Tropical Diseases Bulletin*, 1939, Vol. 36. References to the abstracts are given under the names of the authors quoted and the pages on which the abstracts are printed.

concerned. TOLENTINO (p. 531) considers that resistance and susceptibility to leprosy are probably transmitted hereditarily in Mendelian fashion, resistance being apparently the dominant and susceptibility the recessive character.

DEGOTTE (p. 1016) found an incidence of 44·37 per 1,000 definite and 19·53 suspected cases of leprosy in an examination of 8,294 natives of the general population in an area of the Congo in which the rainfall is heavy. Deficient sanitation and prolonged contact are regarded as factors influencing this heavy rate.

Three authors emphasize the benign character of leprosy in parts of Africa. MUIR (p. 531), reporting on leprosy in East Africa confirms the high incidence in the N.E. Belgian Congo, Uganda and Equatorial Sudan and states that in the uplands of Kenya it is less prevalent than on the coast and in Tanganyika. The severity of the disease, however, does not correspond with the incidence, and this is attributed to the widespread infection involving even those with higher degrees of natural resistance, who develop a mild form. GERMOND (p. 234) estimates the incidence of leprosy in Basutoland at a little over 2 per 1,000. The majority of the cases seen during a survey of the eastern border districts were remarkably benign and most of the recurrences were mild. There appeared to be no relationship between malnutrition, scabies and syphilis on the one hand and leprosy on the other, and most infected families were well nourished. The incidence appears to be much greater in the highlands than in the lowlands. STRACHAN (p. 533) has had a similar experience in Basutoland and reports the existence of a large number of abortive cases. During 10 years 61 per cent. of early untreated N1 cases appeared to undergo spontaneous arrest.

Discussing leprosy in India, JOSEPH (p. 532) confirms previously expressed views that the disease is most prevalent in hot, humid climates, and least prevalent at high altitudes where the vapour tension is low. Castes and marriage customs help to spread the disease, and in schools and colleges the highest incidence is in children under 12 years. There is a high incidence in the poor, who live in bad sanitary conditions. COCHRANE and RAJAGOPALAN (p. 238) in 1871 school-children in Saidapet, Madras, found 40 with early and 3 with late signs of the disease and 65 who were probably leprotic.

In Burma, LOWE (p. 235) reports incidence rates rising from 1·6 per cent. to 5 per cent., and in children a rate of 5·6 per cent., with a higher preponderance (60 per cent.) of serious lepromatous cases than is found in India. He (p. 236) found that in Burma leprosy is more severe in the Burmans than in the Indians although many of the latter have contracted it in Burma. The disease develops at an earlier age in the Burmans and tuberculoid cases and nerve abscesses are rarer in Burma than in India. Since the Burmans are better fed than the Indians the author suggests that the lack of resistance to the infection among the Burmans is hereditary or racial. [See also TOLENTINO above.]

CILENTO (p. 1017) reports on a focus of leprosy in N. Queensland in which both whites and aboriginals are infected, and DAVIS (p. 1017) shows that in the north of Western Australia notifications have increased from 2–7 in 1908 to 1932, to 41–58 in 1933 to 1936, but in 1937 there were fewer.

SHIONUMA *et al.* (p. 236) consider that in Japan the leprosy seen in the warmer parts is less severe than that which is found in the colder areas.

KERVINGANT and BARÉ (p. 1016) report 31·9 per 1,000 definite and 10·5 suspected in the natives of New Caledonia, and in Europeans rates of 5·2 and 0·5 respectively. They consider that the indigenous cases are stationary in number but the European cases are diminishing.

PIÑERO GARCIA (p. 532) reports that in the Argentine the known incidence has risen from 1 to 2·5 per 10,000 between 1927 and 1937.

LOWE and CHATTERJI (p. 534) consider that although leprosy may be occasionally transmitted by instruments used in scarification, tattooing or vaccination, more commonly there is a latent infection present at the time of injury. Leprosy lesions are frequently treated by scarification, tattooing and the application of the cautery or caustics.

OBERDÖRFFER (p. 1021) repeats his hypothesis that leprosy is predisposed to in the tropics by the use of *Collocasia antiquorum* as food. This contains a highly toxic sapotoxin with a definite seasonal variation.

Aetiology.

Reviewing the bacteriology of leprosy, MCKINLEY (p. 1020) concludes that up to 1917 no organism had been isolated which had been established as the true leprosy bacillus. There is no reason to doubt the status of Hansen's bacillus which is so constantly associated with the disease, and this will probably be cultivated at some time. In comment SCOTT refers to the apparently successful cultivation carried out at the Calcutta School of Tropical Medicine, and to the success obtained by McKinley himself and DE LEON with hormone-glycerol-agar. SUWO and KIN (p. 1021) report some apparent success in cultivating leprosy bacilli (from leprous tissues) in tissue culture. ROUSSEAU and GAUGEAT (p. 539) claim to have cultivated the leprosy bacillus in a fluid Aspergillus medium and describe a cycle of development. ROUSSEAU and GAUGEAT (p. 1021) claim to have cultivated the leprosy bacillus from tissues and blood with ease on Loewenstein's medium. EVANS (p. 1021) obtained growth of chromogenic Mycobacteria (which she considers may be *Myco. leprae*) by using Clegg's method of symbiosis with other bacteria and amoebae.

BURNET (p. 539) has confirmed Adler's success in transmitting human leprosy to the hamster. He infected one animal by inserting part of human leproma beneath its skin; the spleen had not been removed. Attempts in 13 more hamsters, 4 white rats and one spermophile were unsuccessful. SELLARDS and PINKERTON (p. 242) have found that human leprosy material injected into *M. rhesus* produces only low-grade infection, but rats infected intracerebrally from a monkey showed acid-fast bacilli up to 3¾ years without the development of active lesions. TISSEUIL (p. 1019) failed to infect rats with human leprosy material to which were added various biological or chemical substances or other acid-fast bacilli, but succeeded in producing new tuberculoid lesions in lepers by grafting into them skin from tuberculoid lesions of other lepers.

MARCHOUX and PRUDHOMME (p. 240) have used a reducing colour reaction to differentiate living from dead leprosy bacilli *in vitro* and without cultures. By this test they find that the bacilli are killed by exposure to 60°C. for 30 minutes, but not for 15 minutes.

BERTRAND *et al.* (p. 1019) have investigated the pathogenicity of the Kedrowsky bacillus and conclude that it is a bovine type of *Myco. tuberculosis.*

Pathology.

MARCHOUX and CHORINE (p. 540) state that human and rat lepros bacilli cannot pass through unbroken skin but that the smalles superficial lesion will admit them. They pass through healthy mucou membranes, leaving no chancre, and are transported by leucocytes, th local area and associated lymph glands showing the first evidences o invasion. Young experimental animals are not more susceptibl than adults to the rat leprosy bacillus.

DES ESSARTS (p. 540) found that leprosy bacilli in those maculo anaesthetic lesions in which they are present are situated chiefly i the Malpighian layer of the skin but that some are present in hai follicles and sweat glands, through which they may be eliminated. H therefore concludes that such cases may be a danger to others, thoug much less so than those with ulcers.

RADNA (p. 536) confirms the finding of ROGERS that in sever leprosy there is a decrease in blood lipase but that in patients improvin under treatment with Alepol the lipase increases.

Clinical.

BALIÑA and BASOMBRIO (p. 238) suggest a clinical classification whic cannot be further abstracted.

LOWE and CHATTERJI (p. 1015) in Calcutta have analysed th seasonal variations in clinical activity and bacterial findings observe in a large number of patients over a period of 3 years. There appear early in the year to be an increase in bacterial activity which end abruptly in June; corresponding variations in cellular activity follo these changes. The phenomena appear to be related to increase activity in the hot season, ending abruptly with the onset of the rains

LARA (p. 533) has watched the children of lepers for the earlies signs of infection. These he finds on the arms, legs and buttocks which are the areas most frequently in contact with the source o infection in the parents. In 14 of the 35 cases studied the first lesion were small single or multiple weal-like and papular spots, the majority of which were positive on bacteriological examination. The average age at the first appearance was $19\frac{1}{6}$ months.

DE MOURA (p. 237) in Paraná reports nodular leprosy in 14·4 pe cent. of cases; the initial lesions of all forms occurred most frequently on the face followed in descending order by the forehead, hands, fee and legs.

VAN BREUSEGHEM (p. 536) shows that nasal mucus from both nostrils should be taken in diagnosing leprosy since considerably mor positive results are given than when one only is examined.

RADNA (p. 536) found leprosy bacilli in gland puncture materia of 24·5 per cent. of lepers examined and acid-fast bacilli in 4·8 per cent. of non-lepers, but in some of the latter the bacilli could easily be distinguished from *Myco. leprae.* NAIR and PANDALAI (p. 536) found acid-fast bacilli in the lesions of 57·27 per cent. of patients with neura leprosy.

Discussing leprous lesions of the mouth, nose and larynx, PINKERTON (p. 237) points out that there is atrophy and destruction of the cartilages of the nose and septum and escape of the bony structures, in which leprosy differs from syphilis. Nodular lesions may occur on the tongue, soft palate, epiglottis and larynx.

COELHO (p. 244) describes 6 lepers with signs of infantilism which he considers may have been due to the disease acquired in infancy.

BOENJAMIN (p. 244) discusses at length the differential diagnosis between nerve leprosy and syringomyelia; in case of doubt he advises microscopic examination of a thickened nerve, great auricular, peroneal or ulnar.

In a discussion of the tuberculoid form of leprosy RABELLO (p. 239) points out that it occurs in 10 per cent. of Brazilian cases and that familial infections are frequent, though this form is scarcely at all contagious. The lesions result from bacilli distributed through the blood stream to skin, nerves and lymph glands, which are suitable for their growth. TISSEUIL (p. 240) concludes from experimental work that the spread of tuberculoid lesions is due to bacilli in the extending edge and not to trophic or toxic effects. PARMAKSON (p. 239) in Esthonia found tuberculoid changes to be peculiar to nerve cases; the character of the lesions may be related to a certain degree of immunity.

CASSIANO (p. 535) notes that the leprosy reaction may resemble true erysipelas with fever, erythematous oedema and subsequent desquamation. These lesions, however, only occur where there are cutaneous leprosy lesions, are never infective or fatal and are not associated with a streptococcus.

Diagnostic tests.—DEGOTTE and DUBOIS (p. 535) write of the value of the sweating test with Tr. iodi and starch in the diagnosis of suspected cases of leprosy. Pilocarpine or muscular exercise may be used to stimulate sweating.

ROW (p. 537) obtained strongly positive reactions in all cases of cutaneous leprosy tested by a complement fixation test in which a preparation made by prolonged autolysis of tubercle bacilli was used. The test was negative in nerve cases in which no bacilli could be found, and doubtful in tuberculoid cases. PEREIRA (p. 242) gives figures of his experiences with the reaction of Lleras Acosta but has so far failed to obtain results confirming the work of that author. GREVAL *et al.* (p. 537) found that the diagnostic value of the Witebsky, Klingenstein and Kuhn reactions was only considerable in lepromatous cases; the specificity is of a low order since the test is positive in certain other diseases. DI LIDDO (p. 243) also considers this test to be of little value in diagnosis.

FICKER (p. 537) reports favourably on a flocculation test which he has described. SPEIGHT (p. 243) obtained positive serum formalin reactions in 55 per cent. of lepers tested. He (p. 537) shows that the erythrocyte sedimentation rate is a good index to prognosis in leprosy.

PARAS (p. 245) has isolated different fractions of leprosy bacilli from nodules and finds that only the wax is active in producing skin reactions and that these are less intense than those evoked by the whole bacilli of the Mitsuda test.

Treatment.

DE SOUZA-ARAUJO (p. 245), discussing treatment in general, advocates combined methods, including surgical and electrical measures and the use of chaulmoogra preparations.

MANALANG (p. 539) has investigated the effect of chaulmoogra preparations on leprosy bacilli in lymphatic glands removed at autopsy and kept in test tubes. The Culion Mercado preparation was the most effective in causing disappearance of the bacilli and *H. wightiana* oil and esters were most effective in removing acid fastness. In lepromatous lesions the same author (p. 539) reports that intradermal

injections of preparations of *H. wightiana* lead to an increase in the proportion of non-acid fast forms of *Myco. leprae* found, and he regards these as degenerating forms.

The routine treatment at the Botsabelo settlement in Basutoland is by intradermal chaulmoogra esters, and GERMOND (p. 234) reports that 71 patients were discharged with disease arrested during 1937. McNAUGHTON (p. 532) uses iodized chaulmoogra oil injected intramuscularly as a routine treatment and reports unfavourably on methylene blue. Iodized ethyl chaulmoogra ethylate in low dosage intramuscularly is used by SARDJITO *et al.* (p. 235) at Blora in Java, and it is the institution of treatment which has resulted in the voluntary presentation of early cases, though it is too early to pronounce on the attainment of definite cure and improvement. BOENJAMIN (p. 245) obtained satisfactory results with a Philippine preparation of iodized ethyl esters of chaulmoogra and gives details of administration. He treats the leprosy reaction by injections of omnadin. At the Central Leprosarium of Goa (p. 246) intravenous chaulmoogra oil, intramuscular E.C.C.O. or intradermal moogrol iodide are given, and chaulmoogra is given by the mouth or by inunction.

In advanced leprosy of the upper respiratory tract PINKERTON (p. 237) has not found chaulmoogra to be of much value, but spraying the larynx with bland oils is soothing. Resting of the voice affords most relief.

ROSS (p. 246) has treated 5 patients by pyretotherapy but gives no information as to results. Elaborate biochemical tests were made to determine the changes induced, which were all, however, temporary only.

RADNA (p. 1021) points out that the urine of patients with lepromata may be found to contain leprosy bacilli during treatment for syphilis or yaws with N.A.B., although before such treatment the urine was free from the bacilli. Cases of this kind should therefore be treated in hospital.

For leprotic ulcers RYRIE (p. 247) has used Dettol with success both by injection of a 30 per cent. aqueous solution into the affected tissues or by irrigation and dressing with a 10 per cent. solution. Injections cause a rise in temperature, but rapid improvement has been seen. Prolonged application as a dressing may lead to the parts becoming sodden. MEHTA (p. 247) reports that of 287 perforating ulcers, 268 healed under a treatment consisting of the subcutaneous injection, at a site proximal to the lesion and also round it, of a freshly prepared solution of Rivanol 1 grain, glucose 2 grains, calcium lactate 1 grain, sodium thiosulphate 2 grains, water 10 cc. Intense pain, rigors and fever follow the injections. BETZ (p. 247) recommends local application of cod liver oil combined with chaulmoogra.

Control.

After a review of leprosy in East Africa based on a tour of inspection, MUIR (p. 531) makes suggestions for control. There should be a full-time expert to visit institutions and give advice; the voluntary system should be employed to attract patients since experience has led most British countries to abolish compulsion; out-patient clinics may be useful if the patients can be followed to their homes and if examination of contacts can be carried out; occupational therapy should be provided and education of patients attended to. RYRIE (p. 1018) refers to the "bugbear of compulsory institutionalism" as a large

factor in concealment of cases, and advises the use of mobile units for survey propaganda and treatment in Malaya. GERMOND (p. 234) attributes the present satisfactory position in Basutoland to the activities of the Native Leprosy Inspectorate established in 1929. The employment of native inspectors is essential.

MUIR (p. 1018) points out that in S. Africa a modified form of compulsion is employed, and in Nigeria a free colony system with outlying treatment dispensaries.

In Burma the villagers often isolate lepers at some distance from the villages, and LOWE (p. 235) advises that this system should be encouraged and that leper colonies should be founded at small cost. KERVINGANT and BARÉ (p. 1016) show that in New Caledonia 10 leper colonies with good hygienic standards, social amenities and dispensaries to supply regular treatment for infective patients have been instituted in recent years. Uninfective patients are treated in their own villages. Since, however, there is evidence that patients with neural leprosy may become bacteriologically positive, both JEREMIAH (p. 540) and BARTHOLOMEUSZ (p. 540) advocate that they should be segregated [see also DES ESSARTS above, *Pathology*].

Rat Leprosy.

PRUDHOMME (p. 240) shows that rat leprosy bacilli are killed by heating to 100°C. for 5 minutes, by 1 in 100 formol in 15 minutes and by ultra violet rays in 10 minutes.

MARCHOUX and CHORINE (p. 241) show that infection of white rats takes place with certainty after inoculation of 5 rat leprosy bacilli. GOMES (p. 241) claims that rat leprosy bacilli and filterable forms of the same organism are eliminated in the nasal mucus of animals within 24 hours of infection. DE SOUZA-ARAUJO (p. 241) shows that in animals inoculated with rat leprosy bacilli inflammatory granulomata are produced, with bacillaemia and elimination of the organisms in the nasal mucus and in the faeces.

SELLARDS and PINKERTON (p. 242) show that intracerebral injections of rat leprosy produce progressive lesions with frequent generalization, in monkeys, rabbits, white rats and mice, but not in guineapigs. The bacilli invade cells of the reticulo-endothelial system in many organs, whereas non-pathogenic acid-fast bacteria do not produce metastatic lesions. *C. Wilcocks.*

LEISHMANIASIS.

PRÉCIS OF ABSTRACTS IN THIS SECTION.

Visceral leishmaniasis.—CELIK (p. 767) reports the first case of kala azar in an adult in Turkey. Canine kala azar is reported for the first time from the Niger Province by MORNET (p. 768) and from Brazzaville by MALBRANT (p. 768).

ADLER (p. 768) records the effect of cultures of *L. donovani* inoculated into man ; although heavy infection resulted there were no symptoms of kala azar and the factors which determine individual susceptibility to kala azar, are quite unknown. In certain phagocytic cells there were masses of parasites, in others there were few.

CHUNG and WANG (p. 769) show that infection with *L. donovani*, cured with neostibosan, protects hamsters against infection with *L. canis*. The same authors (p. 769) find that, in hamsters, susceptibility to *L. donovani* infection is increased by splenectomy and by the administration of benzol.

SMITH *et al.* (p. 769) report that sandflies kept alive, by feeding on raisins, for 10 days after infection, may become blocked with flagellates after the manner of fleas with plague bacilli. It seems probable that in attempting to feed, such flies must dislodge flagellates into the skin.

KIRK and LEWIS (p. 770) give information concerning the species of *Phlebotomus* found in the Sudan.

MURANO (p. 770) shows that increased production of complement in kala azar is associated with hyperplasia of the histiocytes, but that there is no relationship between the amount of complement and the number of leucocytes present in the blood.

KIRK and SATI (p. 771) have found puncture of the superficial inguinal lymph glands to be a simple and reliable procedure for the diagnosis of kala azar in the Sudan, and set down in detail the technique employed. They point out that in the Sudan skin lesions of the face, arms and legs are common in kala azar, and that leishmania may be found in scrapings from these.

YOUNG (p. 771) reports 156 cases of kala azar in N. China. Diagnosis was made as a result of spleen or liver puncture in all except 9. In smears from the spleen, heavily infected cells break up so that the leishmania appear to be free, but this is not so in tissue sections [see also FLARER below]. A positive aldehyde test was given in 91 per cent. of cases. BRUMPT (p. 772) discusses sternal puncture in the diagnosis of tropical disease, emphasizing its special value in kala azar. He gives the average findings in myelograms in that disease. POPOTAS (p. 772) considers sternal puncture to be the best method for the discovery of leishmania in suspected kala azar.

WANG (p. 773) reports a patient with kala azar in whom subcutaneous nodules, containing *L. donovani*, were found.

HUANG (p. 773) reports 42 cases of acute agranulocytosis complicating kala azar in China. In 20 this was the result of kala azar and in 17 the result of treatment with antimony, the various preparations of which are discussed from this point of view. A platelet count of over 100,000 indicates a good prognosis and in treatment the drug of choice is pentnucleotide.

HORGAN and KIRK (p. 774) point out that although the value of antimony in treatment is very great in India, China and the Mediterranean area, this is not so in the Sudan, where relapses after antimony treatment are relatively common and fatal. BHATTACHARJEE (p. 774) shows that alarming anaphylactic symptoms may occur after treatment with pentavalent antimony compounds. Methods of prevention and treatment are given.

SUN and CHANG (p. 775) report that a new pentavalent antimony compound "Distibinyl" is as efficacious as other compounds in the treatment of kala azar, but is cheaper. Details of dosage are given.

ADLER and TCHERNOMORETZ (p. 775) show that 4 : 4′-diamidino stilbene has a marked effect in eradicating *L. donovani* infection of hamsters, and ADAMS and YORKE (p. 775) report definite signs of improvement in an Indian with kala azar, who was given 360 mgm. of this drug during 8 days' treatment. ADLER and RACHMILEWITZ

(p. 776) report success in treatment with the same drug in a patient in Palestine.

Muco-cutaneous leishmaniasis.—PESTANA and PESSÔA (p. 776) report a small endemic focus of cutaneous leishmaniasis in the municipality of São Paulo.

FLARER (p. 776) has studied leishmania from oriental sores and concludes that although the normal method of reproduction is by binary fission, true schizogony also takes place. He states that extracellular schizonts may be found, but WENYON in comment points out that the author has made these observations on smear preparations, which give misleading appearances because large infected macrophages suffer damage in the process of smear making, and that small portions of broken-off cytoplasm of these cells, containing a number of parasites, may easily give the impression of extracellular multinuclear forms [see also YOUNG above].

TRIFILÒ (p. 777) reports a lesion of the tongue in which *L. tropica* were found. BERLIN (p. 777) notes a condition seen in Palestine in which after healing of cutaneous leishmaniasis there appear secondary lesions in the scar tissue. These are very indolent but heal spontaneously. They resemble lupus and only rarely can leishmania be found. Papules of the extremities were also seen in one case.

BENEDEK (p. 778) describes a patient with a condition which he diagnosed as muco-cutaneous leishmaniasis, claiming it to be the first autochthonous case in the U.S.A. In comment, however, WENYON states that on the evidence given the diagnosis cannot be accepted, and gives his reasons for this view.

GOMES (p. 778) describes the intradermal reaction in which the antigen consists of washed flagellates in saline. It is a group reaction in leishmaniasis.

AKRAWI (p. 779) records cure within a month in 63 per cent. of a series of oriental sores in Baghdad by means of local application of powdered M. & B. 693. SENEKJI (p. 779) shows that trypaflavin and certain other drugs are actively lethal to leishmania in culture, and that trypaflavin causes immediate lysis of the flagellates. Sulphanilamide has only slight inhibitory action.

In Italy there is little doubt that the vector of oriental sore is *Phlebotomus perfiliewi* (*P. macedonicus*) and VANNI (p. 779) shows that breeding takes place in dung heaps. If these are near the houses the disease occurs, but it is practically absent in those districts in which the heaps are not allowed within 80–100 metres of the houses. Prophylactic measures may be based upon this fact, together with protection by nets and treatment of cases. [For treatment with vanadium see PEREIRA below, p. 818.] *C. Wilcocks.*

CELIK (O. Serefettin). Le premier cas de kala-azar chez l'adulte en Turquie. [**First Case of Kala Azar in an Adult in Turkey.**]—*Bull. Soc. Path. Exot.* 1940. Jan. 10. Vol. 33. No. 1. pp. 14–18.

The only cases of kala azar hitherto reported from Turkey have been in children. The present case is the first to be noted in an adult. The patient, a man 37 years of age, had lived in Istanbul for seven years but seven months before his illness commenced he had visited his native town of Ineboli on the Black Sea, which is known to be an endemic focus for infantile kala azar. *C. M. Wenyon.*

ASSIEN TAHAR (S.), EERKENS (J. W.), DJOEHANA (R. Md.) & SARDJITO. Een geval van kala-azar. [**A Case of Kala Azar.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1940. Feb. 6. Vol. 80. No. 6. pp. 347–350. With 7 figs. on 1 plate.

A case of kala azar in a Chinese who came to the E. Indies from Shantung a year before the first symptoms of abdominal pain and fever became manifest. This case, like others which have been noted in the E. Indies, is evidently one in which infection had been acquired before arrival in this country, which is not an endemic centre of the disease. *C. M. W.*

MORNET (P.). Un cas de leishmaniose canine au Niger. [**A Case of Canine Kala Azar in the Niger Territory.**]—*Bull. Soc. Path. Exot.* 1940. Apr. 10. Vol. 33. No. 4. pp. 253–256.

Though cases of kala azar in dogs have been reported on a number of occasions from Dakar, this is the first record of the canine disease in the Niger Province, where the author was able to diagnose a case by the discovery of leishmania in a number of skin lesions from which the dog suffered. A cure was obtained by the use of stibyal.

C. M. W.

MALBRANT (R.). I. Existence de la leishmaniose canine au Congo Français. II. Ankylostomiase canine et formol-gélification. [**Existence of Canine Kala Azar in the French Congo. II. Canine Ankylostomiasis and Formol-Gelification.**]—*Bull. Soc. Path. Exot.* 1940. Jan. 10. Vol. 33. No. 1. pp. 12–14.

The paper records the discovery of three cases of canine kala azar in dogs in Brazzaville, French Equatorial Africa. This is the first discovery of the canine disease in this colony, where two human cases have already been reported. One of the dogs in question had been imported from France but the other two were of local origin.

C. M. W.

ADLER (S.). **Attempts to transmit Visceral Leishmaniasis to Man. Remarks on the Histopathology of Leishmaniasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Jan. 29. Vol. 33. No. 4. pp. 419–437. With 3 plates & 8 figs. [12 refs.]

Working with three strains of *Leishmania donovani* of Indian origin, the author attempted to infect 5 cases of inoperable carcinoma by the injection of massive doses of cultures of this organism and in two of the cases by additional injections of emulsions of the organs of heavily infected hamsters. Only one of the patients who received injections of cultures alone became infected. Though a heavy infection resulted, no symptoms of kala azar developed during 9 months' observation. There was no marked enlargement of the spleen and neither fever nor leucopenia. At post mortem examination two types of cell infection were noted: in one the cytoplasm was packed with parasites as in the case of reticular cells of the spleen and Kupffer cells of the liver; in the other there were few parasites in the cell as in the case of adventitial cells of the arteries, Glisson's capsule, trabeculae of the spleen, and connective tissue of the stroma of the malignant growth.

All these cells are evidently phagocytic. Though the Kupffer and other cells were packed with parasites they still were capable of phagocyting plasma cells, lymphocytes and even other infected cells. It was shown that the serum of the infected patient had a lytic action on the flagellates grown in cultures from this case. The factors which determine individual susceptibility to kala azar are quite unknown.

C. M. W.

CHUNG (Huei-Lan) & WANG (C. W.). **The Immunity to Infection with *Leishmania canis* of Hamsters Recently Cured of *Leishmania donovani* Infection.**—*Chinese Med. Jl.* 1939. Dec. Vol. 56. No. 6. pp. 519–522.

Five Chinese hamsters which had been cured of experimental *Leishmania donovani* infections by subcutaneous injections of neostibosan were inoculated intraperitoneally, together with 5 control hamsters, with emulsion of the spleen of a hamster which had been infected with the local *L. canis* from a naturally infected dog. All the 5 control animals developed heavy infections but of the cured animals only two became lightly infected. This suggests that the human and canine strains in N. China are either identical or very closely related to each other. In an earlier paper WANG and LEE (1928) showed that of 12 hamsters cured of infection with a human strain 8 were refractory to reinoculation with the same strain. *C. M. W.*

WANG (C. W.) & CHUNG (Hui-Lan). **Splenectomy and Benzol Injection as Means of increasing Susceptibility of Chinese Hamsters to Kala-Azar.**—*Proc. Soc. Experim. Biol. & Med.* 1940. May. Vol. 44. No. 1. pp. 35–38.

The authors have made a careful comparison between three groups of hamsters as regards their susceptibility to intraperitoneal injection of the culture forms of *Leishmania donovani*. The first group were animals which had recovered from splenectomy, the second group animals which had received 0·5 cc. to 2 cc. of a mixture of equal parts of benzol and olive oil 30 hours to seven days before injection of flagellates and the third group were normal animals. Susceptibility was gauged not only by the presence of leishmania but also by the intensity of infection. It was found that susceptibility was increased both by splenectomy and benzol, but that the former was more marked in its action in this direction. *C. M. W.*

SMITH (R. O. A.), HALDER (K. C.) & AHMED (I.). **Further Light on the Mechanism of Sandfly Transmission of Kala-Azar.**—*Indian Med. Gaz.* 1940. Feb. Vol. 75. No. 2. pp. 67–69.

INDIAN MEDICAL GAZETTE. 1940. Feb. Vol. 75. No. 2. pp. 97–98.—**The Transmission of Kala-Azar.**

The paper records important observations on the habits of sandflies (*Phlebotomus argentipes*) in captivity which may help to explain the method of transmission of kala azar. It has been noted that these flies after feeding on a case of kala azar may be kept alive more readily not by giving them successive blood meals but by allowing them to feed on raisins, as is commonly the practice with captive mosquitoes. Not only do the sandflies live longer but the flagellate development is

more intense. When the flies at the end of ten days are offered a blood meal on an experimental animal they feed readily, at least the majority do so, for it was noted that some struggled in vain to suck blood. Dissection of a number of such unsuccessful flies showed that the flagellate development had been so intense that, as in the case of fleas infected with plague bacilli, there was a complete blockage of the oesophagus. It would seem that such blocked flies during their efforts to imbibe blood must dislodge the flagellates, which would then readily pass into the skin. It seems possible that these observations afford a clue to the reason why it has been so difficult to transmit infections by flies which have been given repeated blood meals. Experiments are being carried out to test the infectivity of flies which have been fed in the manner described.

In the Editorial are traced the various stages by which investigations carried out in India have led to the development of the theory of sandfly transmission of kala azar, and it is pointed out that the observations noted in the paper reviewed above bring the final incrimination of this insect a stage nearer. *C. M. W.*

KIRK (R.) & LEWIS (D. J.). **Studies in Leishmaniasis in the Anglo-Egyptian Sudan. III.—The Sandflies** (*Phlebotomus*) **of the Sudan.** —*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Apr. 30. Vol. 33. No. 6. pp. 623–634. With 5 figs. (2 on 1 plate) & 1 map. [26 refs.]

Of the 23 species of *Phlebotomus* which occur in Africa, 13 are here recorded from the Sudan, and six are known to bite man. *P. langeroni* var. *orientalis* is the only member of the "*major* group" which occurs, and all the places in which it has been found are within the area in which kala azar is endemic.

Many of the species, including some which frequently bite man, have been found at considerable distances from human houses; for instance, *P. langeroni* var. *orientalis* has been collected 4 or 5 miles out in the wilderness.

The paper contains much useful information on the biology of the adults of many species. *P. A. Buxton.*

MURANO (Giulio). Sull'interessamento del sistema reticolo-istiocitario nella leishmaniosi interna. 3. Il potere complementare nella leishmaniosi interna. [**Role of the Reticulo-Endothelial System in Kala Azar. 3. Complement Production in Kala Azar.**]—*Pediatria.* 1940. Feb. Vol. 48. No. 2. pp. 83–89. [32 refs.]

The author has investigated complement production in cases of infantile kala azar with a view to throwing some light on the function of the reticulo-endothelial system in this direction. He claims to have shown that increased production is associated with the hyperplasia of the histiocytes, possibly as a result of the changes which are thus brought about in the colloids or proteins of the serum. The results indicate that the leucocytes do not play a part in complement production, for there is no relationship between the amount of complement and the number of leucocytes present in the blood. It thus comes about that an increase in complement does not mean an increase in the defensive mechanism of the body, which in kala azar is very susceptible to intercurrent infections. *C. M. W.*

KIRK (R.) & SATI (Mohammed Hamad). **Studies in Leishmaniasis in the Anglo-Egyptian Sudan. II.—The Skin and Lymph Glands in Kala-Azar.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Mar. 20. Vol. 33. No. 5. pp. 501–506. [10 refs.]

Cases of kala azar in the Sudan are likely to show skin lesions, especially on the face, arms and legs, in the form of small superficial papules or ulcers. In 31 of a series of 54 cases leishmania were found in scrapings of these lesions. At the same time it is noted that leishmania are rarely to be found in films of the peripheral blood. As regards the diagnosis of kala azar the authors have found that gland puncture is a simple and reliable procedure. In thirty consecutive cases of the disease they have shown the presence of leishmania in smears of gland juice obtained by puncture. The technique employed at Singa in the Sudan is very simple and in the authors' own words is as follows :—

"The glands to be punctured are the lower group of the superficial inguinal lymph glands (*Gray's Anatomy*, 1938), which are disposed vertically along the terminal part of the long saphenous vein, and receive all the superficial lymph vessels of the lower limb except those from the back and lateral side of the calf of the leg. They can usually be readily palpated if a deep grip is taken with the thumb and forefinger. The skin having been sterilized, the glands are identified, pulled up from the underlying tissues and steadied above the thumb and forefinger of the operator's left hand. A dry, sterile hypodermic needle (No. 16 is a convenient size) is pushed through the skin and into the gland by the right hand of the operator. No syringe is attached to the needle, as once the gland has been penetrated the juice runs up into the needle of its own accord. It is usually easy to feel when the needle has entered the gland. Once the needle has entered the gland, it is held there for a second or two, then quickly withdrawn, and attached to a small syringe by means of which the gland "juice" in the needle can be blown out on to a slide and stained in the usual way for examination. With practice, the operation can be carried out very rapidly, and the amount of danger or discomfort to which the patient is subjected is negligible."

If the authors' findings are confirmed for other endemic areas of kala azar the diagnosis of the disease will be considerably simplified and the dangers and inconvenience of puncture of internal organs avoided.

C. M. W.

YOUNG (Shutsu). **Kala-azar in Pi-Hsien District, Kiangsu Province, China. II. Findings in Films of Spleen and Liver Puncture Juice and Some Other Observations in Kala-azar.**—Reprinted from *Jl. Shanghai Sci. Inst.* 1939. Nov. Sect. 4. Vol. 4. pp. 265–272. With 2 text figs. & 13 figs. on 4 plates.

Notes are given of observations carried out in 156 cases of kala azar in the Pi-Hsien district of N. China. In all but nine cases diagnosis was made by the discovery of leishmania in smears of spleen or liver puncture material. Spleen puncture was performed in 144 of the cases without accident and leishmania were found in all but one. In this one case and in three others they were demonstrated by liver puncture. In the 9 cases in which puncture was not made a diagnosis was established by the aldehyde test. Liver puncture was made in 81 cases and parasites were found in 74. In 75 of 97 of the cases a strongly positive aldehyde reaction was obtained. In the other cases the reactions were less marked but a positive result was given by 91 per

cent. of the cases tested. An abnormal appearance of the leishmania from one case is noted. This consisted of the presence of a large vacuole which pressed the nucleus and the kinetonucleus to the side of the parasite, giving the appearance of a ring. It is noted that in smears of the spleen the heavily infected cells break up so that many leishmania are free. It is pointed out that such an appearance is artificial, for in sections of the same tissue all parasites are intracellular. A search for parasites in nasal secretions in 26 cases was negative.

C. M. W.

BRUMPT (L. C.). La ponction médullaire dans les maladies parasitaires. [**Medullary Puncture in Parasitic Diseases.**]—*Ann. Parasit. Humaine et Comparée.* 1939–1940. Vol. 17. No. 6. pp. 481–514. With 1 fig. & 1 plate. [Bibliography.]

This is a comprehensive article on the subject of sternal puncture, particularly in its application to the diagnosis and study of tropical diseases. An historical survey of the introduction of the procedure of examination of bone marrow by PIANESE, GHEDINI and SEYFARTH is followed by a description of the technique and apparatus required for puncture of the sternum. It would appear that of tropical diseases kala azar is the one for which the operation is most useful. Compared with spleen puncture sternal puncture has much to recommend it. It is easy to carry out, requires no previous preparation of the patient, is free from pain except at the moment when marrow is actually being drawn into the aspirating needle, is not dangerous, and can be repeated often during the course of treatment. Furthermore the character and proportions of cells present, giving what is termed the myelogram, afford valuable information of prognostic value. In 38 myelograms from cases of kala azar the following average percentages were obtained—granulocytes 23, erythroblasts 24, hyaline leucocytes 53. Normally the granulocytes are four times as numerous as the erythroblasts and 3·5 times as numerous as the hyaline leucocytes. A very useful semi-diagrammatic plate shows the various cells present in the sternal marrow of a patient with kala azar and the presence of parasites in a haemohistioblast, their usual habitat.

The procedure of sternal puncture is of less value in trypanosomiasis, malaria, filariasis and spirochaetosis, but it would probably be of diagnostic value in mycotic conditions such as histoplasmosis. In all cases, however, the myelogram throws light on the various anaemic conditions which result from so many infections in the tropics. The paper concludes with a long list of references. *C. M. W.*

POPOTAS (Ch.). Bedeutung der Sternalpunktion für die Diagnose der Kala-Azar. [**Importance of Sternal Puncture for the Diagnosis of Kala-Azar.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1940. Feb. Vol. 44. No. 2. pp. 79–80.

The author, working in Greece, has come to the conclusion that sternal puncture is the best method for the discovery of leishmania in cases of suspected kala azar. He gives notes of three cases in which spleen puncture and both the formol gel and antimony reactions were negative, while sternal puncture enabled a demonstration of the presence of leishmania to be made. *C. M. W.*

WANG (C. W.). **A Kala-Azar Patient with Subcutaneous Nodules containing Leishman-Donovan Bodies.**—*Far Eastern Assoc. Trop. Med. C.-R. Dixième Congrès Hanoi, 26 Nov.–2 Dec., 1938.* Vol. 2. pp. 113–116. With 4 figs. on 2 plates.

The patient was a Chinese school-teacher, aged 35 years, showing small nodules on the skin of the arms, 16 in number, moveable, measuring 2–6 mm. in diameter. They were found to consist of proliferating reticulo-endothelial cells and masses of lymphocytes and in the former were many L. D. bodies. The author adds—"It is obvious histologically that these nodules have nothing in common with dermal leishmaniasis," though he does not particularize in what respects they differ. The infection was chronic and severe (as is the case with dermal leishmanoid) and an intensive treatment with urea stibamine, about double the average total dosage for an ordinary case, was needed. He avers also that subcutaneous nodules containing Leishman-Donovan bodies have never been observed before in kala azar. *H. H. S.*

HUANG (C. H.). **Acute Agranulocytosis in Kala-Azar.**—*Chinese Med. Jl.* 1940. Feb. Vol. 57. No. 2. pp. 119–140. With 6 charts. [10 refs.]

The occurrence of acute agranulocytosis as a complication of kala azar was first noted in N. China by ZIA and FORKNER, who gave an account of 8 cases [this *Bulletin*, 1935, Vol. 32, p. 483]. The present paper deals with 42 cases (including the eight cases just mentioned) which have been treated in the hospital of the Peiping Union Medical College during the past 10 years. During this period 554 proved cases of kala azar were admitted to hospital and the complication occurred in 42, or 7·6 per cent., of these, whereas only 20 cases were observed unassociated with kala azar. The 42 cases were classified as acute agranulocytosis not merely because the granulocytes were below 20 per cent., but also because of their sudden fall to this low figure. In the case of infants, who have normally a lower granulocyte count than adults, a rapid fall to less than 10 per cent. in association with typical angina was required before a diagnosis was made. Of the cases 38 showed the characteristic picture of fever, throat or skin lesions, and marked granulocytopenia. The four other cases had no ulceration or exudate on the pharyngeal mucosa. The throat condition in some of the cases showed a similarity to faucial diphtheria. In the series it was possible to determine that 20 cases were the result of kala azar and 17 the result of the treatment with neostibosan or ureastibamine. The cause, whether kala azar or antimony, in the other cases was undetermined. Among the 20 cases there were 2 deaths, while among the 17 there were 5 deaths. It would thus appear that the condition resulting from the antimony treatment was more serious than that arising from the leishmania infection. The mortality from acute agranulocytic angina due to other causes was 11 in the 20 cases seen. As regards the rôle of the antimony drugs used in the 17 patients (one of whom had two attacks) neostibosan was responsible for 13 attacks and ureastibamine for only 5. This is remarkable in that ureastibamine is more toxic than neostibosan as regards nausea, vomiting, chills, headache, vertigo and other reactions; moreover it was more frequently used than neostibosan. It is suggested that antimony intoxication induces a sudden

change in the number of granulocytes and that this favours the development of the acute condition. In this connexion it may be noted that ureastibamine contains less antimony than neostibosan and is thus less likely to lead to antimony intoxication. It requires to be given over a longer period but the therapeutic effects are better than those obtained with neostibosan. As regards treatment of the condition, in 40 cases 13 received no treatment, with 4 deaths, 12 were given blood transfusion, with 2 deaths, while of 9 cases treated with pentnucleotide one died. It is admitted that it is difficult to draw conclusions as to the relative value of the various methods of dealing with the cases in such a small series, particularly as there was considerable individual variation as regards number of neutrophiles in the blood, quantity of haemoglobin, number of platelets and the general condition. It would seem that a platelet count of over 100,000 is a good feature from the point of view of prognosis. The drug of choice appears to be pentnucleotide but further studies are required before a final conclusion can be drawn. Blood transfusion did not seem to be very helpful. After recovery from acute agranulocytosis due to kala azar there is a tendency towards relapse, so that antimony treatment should be resumed as soon as possible to prevent such recurrences. *C. M. W.*

HORGAN (E. S.) & KIRK (R.). **Antimony Treatment of Kala-Azar.** [Correspondence.]—*Nature.* 1940. Feb. 10. Vol. 145. No. 3667. p. 228.

The note by Sir Leonard ROGERS in *Nature* [this *Bulletin*, 1940, Vol. 37, p. 350], in which he points out the value of antimony in the treatment of kala azar, has led the writers of this letter to the Editors to state that though good results have followed the use of antimonials in India, China and the Mediterranean area, this is far from being the case in the Anglo-Egyptian Sudan, where relapses after such treatment occur in a considerable proportion of the cases. The immediate response may be good, but when relapse occurs there appears to be considerable resistance to further antimony treatment, so that the majority of relapse cases terminate fatally. *C. M. W.*

BHATTACHARJEE (Jagadish C.). **Toxic Reaction after Pentavalent Antimony Injections.**—*Med. Bull.* Bombay. 1940. Jan. 6. Vol. 8. No. 1. pp. 5–7.

Though pentavalent antimony compounds are less toxic and more efficacious in the treatment of kala azar than antimony tartrates they sometimes produce alarming symptoms of an anaphylactic character which may even lead to collapse and death. The more common toxic symptoms are vomiting, fits of coughing, flushing of the face, faintness and diarrhoea, which usually appear after a number of injections have been given and the maximum dose reached. Much can be done to avoid symptoms by giving the injections slowly, using fresh double-distilled water, employing drugs which are not too old, and keeping the patient lying down for half an hour after administration of the drug. If severe reactions occur adrenalin, pituitrin and ephedrin may be given.

It does not seem possible to avoid reactions entirely, for as long as antimony is to be used for the treatment of kala azar these will occur.

C. M. W.

SUN (C. Jung). **Notes on the Kala-Azar Research in China. The Use of "Distibinyl" in the Treatment of Chinese Kala-Azar.**—*Indian Med. Gaz.* 1940. June. Vol. 75. No. 6. pp. 332–336. With 1 plate.

—— & CHANG (S.). **Notes on the Kala-Azar Research in China. Part II. The Use of "Distibinyl" in the Treatment of Chinese Kala-Azar.**—*Chinese Med. Jl.* 1940. May. Vol. 57. No. 5. pp. 442–448.

The successful treatment of kala azar in China, as indeed in other endemic foci of the disease, is chiefly related to the cost of the various pentavalent antimony compounds available. Attempts have accordingly been made in the Department of Chemistry and Pharmaceutics of the Central Field Health Station, Nanking, China, to prepare a pentavalent compound equal in efficacy to, but cheaper than, others which are on the market. The result is a drug which has been given the name "Distibinyl." It is a powder of a greyish white colour, unstable if exposed to the air. It is given intravenously, dissolved in distilled water, by injections daily or every other day. The initial dose is 0·025 gm. for infants and from 0·05 to 0·1 for adults. The maximum dose for an infant is 0·2 gm. and for an adult 0·3 gm. The total dosage per 45 kilo. body weight has varied from 1·15 to 2·99 gm., with an average of 2·10 gm. in cases which were cured. The conclusion reached is that the new drug is just as efficacious as other preparations but has the advantage of being less costly. It is not stated, however, what system of costing was adopted for arriving at the estimated cost of production.

C. M. W.

ADLER (S.) & TCHERNOMORETZ (I.). **The Action of 4 : 4′-Diamidino Stilbene on *Leishmania donovani* in the Syrian Hamster *Cricetus auratus*.**—*Ann. Trop. Med. & Parasit.* 1939. Dec. 30. Vol. 33. Nos. 3 & 4. pp. 313–322. With 2 plates.

The paper shows that the drug in question when administered to hamsters experimentally infected with *Leishmania donovani* in repeated doses of 2·5 to 40 mgm. per kilogram of body weight has a marked action on eradicating the infection. An account is given of the changes which occur in the spleen as a cure is being effected. *C. M. W.*

ADAMS (A. R. D.) & YORKE (Warrington). **Studies in Chemotherapy. XXIII.—A Case of Indian Kala-Azar treated with 4 : 4′-Diamidino Stilbene.**—*Ann. Trop. Med. & Parasit.* 1939. Dec. 30. Vol. 33. Nos. 3 & 4. pp. 323–326. With 2 charts & 1 fig.

The case recorded is that of an Indian, 31 years of age, who was cured of kala azar by eight intravenous injections of the drug administered in daily doses of 1·0 mgm. per kilo. of body weight. In all 360 mgm. were given during the eight days. The definite signs of improvement, such as the return of the temperature to normal and the retraction of the spleen, did not commence till after the course of treatment had been completed.

C. M. W.

ADLER (S.) & RACHMILEWITZ (M.). **A Note on the Treatment of a Case of *Leishmania infantum* with 4 : 4′-Diamidino Stilbene.**—*Ann. Trop. Med. & Parasit.* 1939. Dec. 30. Vol. 33. Nos. 3 & 4. pp. 327–330.

The paper gives an account of the treatment of a woman, 32 years of age, who contracted kala azar in Palestine, presumably in the early part of 1938. In April 1939, after the diagnosis had been established, a course of stiburamine was given. The patient was apparently cured and was discharged from hospital in good condition, but later in the year the symptoms returned and cultures of leishmania were obtained from the sternal marrow. Two intravenous injections of 60 mgm. of diamidino stilbene followed by three intramuscular injections of 100 mgm. were administered. The treatment was interrupted owing to an attack of amoebic dysentery for which injections of emetine were given. The dysentery having subsided, the kala azar treatment was resumed and 19 intravenous injections of the diamidino stilbene (100 mgm. in 30 cc. of distilled water) were given between July 21st and September 7th. By October 8th the patient was in excellent condition, though there was still some enlargement of the spleen. The patient was discharged from hospital and is under observation as an out-patient. In view of the size of the spleen, the edge of which was below the umbilicus, and its hardness, the result obtained is regarded as satisfactory. *C. M. W.*

PESTANA (Bruno Rangel) & PESSÔA (S. B.). Leishmaniose tegumentar autoctone no municipio de São Paulo. [**Endemic Cutaneous Leishmaniasis in São Paulo.**]—*Ann. Paulist. Med. e Cirurg.* 1939. Dec. Vol. 38. No. 6. pp. 435–442. With 4 figs.

The paper calls attention to previous records of two cases of cutaneous leishmaniasis in the municipality of S. Paulo in Brazil and gives notes of five further cases seen by the authors. These indicate that a small endemic focus of the disease exists in the neighbourhood of S. Amaro. The cases were diagnosed by the discovery of leishmania or by the skin test of MONTENEGRO. Blood examinations show that the disease is associated with a distinct monocytosis. *C. M. W.*

FLARER (Franco). Bisher unbekannte Reproduktionsarten der Leishmanie bei Orientbeule. [**Hitherto Unknown Methods of Reproduction of Leishmania in Oriental Sore.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1939. Sept. Vol. 43. No. 9. pp. 385–403. With 156 figs.

The author has carried out a detailed study of leishmania as they appear in smears from oriental sores particularly from the point of view of the method of reproduction. It is admitted that the normal method is by binary fission but this may take place in many different ways owing to variations in the disposition of the daughter nuclei and kinetonuclei in the dividing parasite. In addition, many abnormal division forms occur, but it would seem that these are of little significance from the point of view of the development of the parasite. The vexed question of schizogony is discussed and, though the author admits that in many cases closely packed individual parasites may give the appearance of schizonts, there are in addition true schizonts in which a single parasite contains many nuclei resulting from nuclear

divisions not being immediately followed by cytoplasmic division. There are thus pseudoschizonts and real schizonts. These are spoken of as either intracellular or extracellular [but the author does not appear to appreciate fully that such distinctions cannot be drawn with reliance from appearances in smear preparations in which the large infected macrophages and other cells suffer damage in the process of film making. It would have been more instructive to examine sections of sores which have been fixed without disturbance of the cells. It can readily be seen in sections that parasites are practically always intracellular, and it is safe to make the deduction that the extracellular forms seen so commonly in smears are in this position as a result of mechanical damage to cells. Small portions of broken-off cytoplasm of cells containing a small number of parasites may easily give the impression of multinuclear forms.] The paper is profusely illustrated, there being 156 figures of the various forms described. *C. M. W.*

TRIFILÒ (Nino). Su di una rara localizzazione della leishmania tropica. [**Unusual Position for** *Leishmania tropica.*]—*Rass. Sanitaria dell' A.O.I.* Addis Ababa. 1939. Sept. 9. Vol. 1. No. 3. pp. 31–34.

The patient, 53 years of age, who had been in Italian East Africa since 1936 noticed in 1939 a slightly raised red area on the left margin of the anterior third of the tongue. This developed slowly in an indolent manner and finally ulcerated. Preparations of the secretion from the sore were submitted to the laboratory at Asmara for examination. The report stated that *Leishmania tropica* was present. [See also this *Bulletin*, 1939, Vol. 36, p. 1031]. *C. M. W.*

BERLIN (Chaim). **Leishmaniasis Recidiva Cutis ; Leishmanid.**—*Arch. Dermat. & Syph.* 1940. May. Vol. 41. No. 5. pp. 874–886. With 6 figs. [18 refs.]

The author has noted in Palestine that in certain cases of cutaneous leishmaniasis or oriental sore after healing and scar formation there appear secondary lesions in the scar tissue. These have the form of flat, round, pinhead-sized to lentil-sized, moderately firm reddish brown papules, which lie singly or grouped and coalescing. The course is protracted, the lesions remaining unchanged for several years. They produce no subjective symptoms and disappear spontaneously, leaving varioliform scars. The condition resembles lupus vulgaris, but usually no organisms are to be found in smears from the lesions. In only 3 of 13 cases noted by the author were leishmania discovered, and then they were scanty. It would seem that with the healing of the primary oriental sore isolated parasites have remained enclosed in the scar tissue and that by very slow development these give rise to the secondary lesions. In one of the cases, the development of the secondary lesions in scar tissue in the face there appeared papules in the extremities. Though leishmania could not be found in these papules it is considered that they were due to infection with these parasites. They persisted for one and a half years and cleared up after treatment with sodium aurothiomalate. The condition described in the paper has been observed by a number of earlier observers whose papers are referred to by the author. A series of excellent photographs shows the character of the lesions. *C. M. W.*

BENEDEK (Tibor). **American Leishmaniasis. Report of the First Autochthonous Case in the United States.**—*Jl. Trop. Med. & Hyg.* 1940. June 1 & 15. Vol. 43. Nos. 11 & 12. pp. 147–155; 164–168. With 8 figs. [31 refs.]

The case described is that of a man, 26 years of age, who had lived all his life in the U.S.A. except for 4 years spent in Poland in his childhood. The disease from which he suffered commenced in 1933 by swelling of the cartilaginous parts of the nose. About 4 months later the septum collapsed, while later still ulceration of the lips and cheek commenced, producing a condition resembling the muco-cutaneous leishmaniasis of Brazil. Finally the bones of the limbs became involved in circumscribed areas of osteomyelitis. The Wassermann reaction was positive, the patient being a congenital syphilitic. The author claims that he discovered leishmania in the lesions in large numbers and also in the blood, as evidenced by their presence in fluid from cantharides blisters. It is stated that guineapigs were inoculated successfully, an acute ulcerative condition of the head, involving the eyes, being produced, associated with the presence of leishmania in the lesions and in the internal organs. The parasites were studied in stained films and also, so the author states, in fresh material under the cover glass. [An illustration shows in 30 figures what are regarded as budding forms of leishmania. These, if organisms at all, must be yeasts. This remark applies also to the figures of the typical leishmania, which are quite unlike these parasites. It is evident that the author has had little experience of leishmaniasis as his statements regarding the organisms he has seen are incompatible with such an identification. The case cannot be accepted as one of American leishmaniasis on the unsatisfactory evidence brought forward.] *C. M. W.*

GOMES (Luiz de Salles). A intra-dermo-reacção de Montenegro na leishmaniose e outras pesquizas affins. [**Intradermal Reaction of Montenegro in Leishmaniasis.**]—*Brasil-Medico.* 1939. Dec. 2. Vol. 53. No. 49. pp. 1079–1087. With 3 figs. [10 refs.] English summary.

The author has followed up the work of MONTENEGRO (1926) on the subject of skin reactions following injections of leishmania antigen in cases of S. American cutaneous and muco-cutaneous leishmaniasis [see this *Bulletin*, 1926, Vol. 23, p. 585]. The antigen the author has employed consists of a suspension of washed flagellates in physiological salt solution, containing four parts of phenol per thousand. Before use the antigen was kept at 2° to 4°C. for 10 days. The test is carried out by injection into the skin. Of 120 observations 97·5 per cent. gave a strongly positive or a moderate but conspicuous reaction, while 2·5 per cent. gave weak reactions, perceptible, however, up to 72 hours after the injection. Two suspensions which had been kept in the ice box for 18 months had lost, when tested, little of their original potency. It was noticed that when antigen was injected intravenously allergic shock resulted and the intensity of this in any one case was directly parallel to the intensity of the skin reaction given by the skin test. The local and general reactions to the antigen are group reactions as far as species of leishmania are concerned. It was not given by cases

with other types of skin disease nor by cases of S. American trypanosomiasis. In honour of Montenegro, who introduced the test in 1926, the author thinks it should be known as the Intra-dermal Reaction of Montenegro. *C. M. W.*

AKRAWI (F.). **The Local Treatment of Ulcerated Oriental Sore by the Powder of Certain Sulphonamide Derivatives.**—*Jl. Trop. Med. & Hyg.* 1940. Jan. 1. Vol. 43. No. 1. pp. 4–6.

The paper records the treatment of a series of 72 cases of ulcerating oriental sore in Baghdad with M. & B. 693 or Uleron. The drug is applied directly to the sore in powder form after cleansing with saline solution. Of the cases treated 37·7 per cent. were cured in 15 days or less and a further 25 per cent. within a month. Thus 63 per cent. were cured in a month's time, a result which is distinctly better than that obtained with other forms of treatment. It would seem that the rapidity of cure in some cases shows that the drug acts not merely by suppression of secondary infections. An advantage of the treatment is that there is no destruction of tissues and consequently a good scar is produced. *C. M. W.*

SENEKJI (H. A.). **A Comparison of the Efficiency of Certain Drugs and Dyes in killing Cultures of** *Leishmania tropica.*—*Jl. Path. & Bact.* 1940. Jan. Vol. 50. No. 1. pp. 171–176.

——. **The Effect of Sulfanilamide and Trypaflavin on Cultures of** *Leishmania tropica.*—*Jl. Infect. Dis.* 1940. Mar.–Apr. Vol. 66. No. 2. pp. 111–112.

The author has exposed standard emulsions of washed flagellate forms of *Leishmania tropica* to the action of a number of drugs, including sulphanilamide derivatives, and disinfectant agents in varying dilutions and for varying times. After exposure fresh culture medium was inoculated from the treated flagellates, but the author does not state that the flagellates were washed free of reagent before their viability was tested in this way. It would seem that a fallacy has been introduced by this omission. However this may be, it is noted that the most actively lethal substances were trypaflavin, euflavin, rivanol and the green and violet dyes. In these studies the author has used his own culture medium [this *Bulletin*, 1939, Vol. 36, p. 1024].

In the second paper the author describes further experiments with sulphanilamide and trypaflavin. The former has little action on the flagellates, which are able to continue their growth in certain concentrations of the drug. There is only a slight inhibitory action, even in the presence of whole blood. This action is a direct one, phagocytosis playing no part in the process. Trypaflavin, on the other hand, is highly toxic, causing immediate lysis of the flagellates.

C. M. W.

VANNI (Vittorio). Epidemiologia, transmissione e profilassi della leishmaniosi cutanea in Italia. [**Epidemiology, Transmission and Prophylaxis of Oriental Sore in Italy.**]—*Ann. d'Igiene.* 1940. Feb. Vol. 50. No. 2. pp. 49–58. With 4 figs. [13 refs.]

A study of the epidemiology of oriental sore in the provinces on the Adriatic coast of Italy has shown a definite association of *Phlebotomus*

perfiliewi (syn. *P. macedonicus*) with the disease, so much so that there is little doubt that this species is the vector in these districts. Investigations have shown that the breeding places of this insect are the dung heaps which vary in distance from the rural houses, the inhabitants of which are human beings on the upper floor and horses and cattle on the lower. It would seem that the incidence of oriental sore is in direct relationship to the proximity of the dung heaps to the houses. In the province of Campobasso, where a local law prohibits the formation of dung heaps within 80 to 100 metres of the houses, oriental sore is practically non-existent, though the sandfly vector is there. It is evident that prophylactic measures can be based on this knowledge and consist in protection from bites by suitable nets, removal of dung heaps if these are too near the houses, cure of the cases by means of local atebrin injections or intramuscular Fouadin, and distribution of information. *C. M. W.*

MALARIA.

Précis of Abstracts in this Section.

Baisas (p. 782) reports investigation in a part of the Philippine Islands in which there had occurred an epidemic of malaria. The cause of the epidemic was not clear. Russell *et al.* (p. 782) record findings in the examination of children in two areas in Southern India ; in one malaria is transmitted throughout the year, in the other transmission is seasonal, in accordance with irrigation, and is of recent introduction.

Young *et al.* (p. 783) describe the development of trophozoites and schizonts of *P. malariae.*

Vargas and Freire (p. 784) describe the methods they use to colour mosquitoes in studies to determine their range of flight.

Cambournac and Hill (p. 784) give a detailed account of the biology of *A. maculipennis* var. *atroparvus* in Portugal. Breeding takes place for the most part in the rice fields which are flooded from May to September. The larvae can withstand fairly high water temperatures and are found in water the salinity of which lies between 50 and 130 mgm. per litre. Females do not usually hibernate in the relatively mild winter, but move into the open and feed on the warmer days. In June, larvae may number 400 per square metre in the rice fields. Sheds containing animals are preferred as shelters, but houses are invaded if the mosquitoes are numerous ; feeding takes place in shelters, never in the open. Animal blood is preferred but man is attacked if the mosquito density is high and endemic malaria therefore fluctuates with mosquito density. Weyer (p. 786) states that in N. Germany during the last 8 years there has been no change in the racial composition of the *Anopheles maculipennis* populations.

In a malaria survey of Mombasa, Wiseman *et al.* (p. 786) show that the incidence is high, with peaks after the two rainy seasons. *A. gambiae* and *A. funestus* are the vectors of malaria, but the most prevalent mosquito is *Aëdes aegypti*, while several others, known to be potential transmitters of yellow fever, are found. Monkeys which may become reservoirs of yellow fever are present and the authors

point out that this coastal area would almost certainly become an endemic area should yellow fever be introduced. *Culex fatigans* is the commonest mosquito in houses and is a known vector of *W. bancrofti*, and filariasis occurs in this area. Recommendations for mosquito control are given. ADAMS (p. 788) shows that *A. funestus* can travel 4·5 miles down wind and 1·5 miles at an angle of 30° up wind. *A. gambiae* can travel 4·25 miles down wind and 1·5 miles at a right angle to the wind.

HINMAN and HURLBUT (p. 788) state that in the Tennessee valley *A. quadrimaculatus* passes the winter solely as a hibernating female after insemination. They (p. 788) find that shading of breeding places appears to have only slight effect in reducing the number of larvae of this mosquito.

BLACK (p. 789) reports transmission of malaria from one patient to another in the course of intravenous neoarsphenamine injections owing to the use of tubing which was contaminated by the blood of each patient and which was not changed for each patient. CHUNG *et al.* (p. 789) in reporting malaria in heroin addicts state that they have found *P. falciparum* and *P. vivax* in the residual fluid of syringes used in heroin dens.

SCHILLING (p. 790) records further work on the immunization of man against malaria and states that adult man possesses a natural resistance against minimal numbers of both schizonts and sporozoites of the Madagascar strain of *P. vivax* and that this may be increased by subcutaneous inoculation of increasing doses of schizonts and sporozoites, though the latter are uncertain in their action.

CANNATA (p. 790) reports two cases in which unsuspected malaria became active during the course of acute infectious disease. LERICHE (p. 790) reports gingivo-stomatitis complicating malaria. CASQUEIRO (p. 791) describes the delayed retraction of the uterus which may occur in malarious patients.

CRAIG (p. 791), in protesting against the "short-term" treatment of malaria with quinine states that there is no adequate evidence that it results in any immunity. It is dangerous in that it does not prevent the development of pernicious symptoms in subtertian malaria and it favours transmission by allowing the development of the carrier state. BANERJEA (p. 791) contributes a note on the manufacture and retail sale of quinine tablets in the rural areas of the United Provinces.

ROBERTSON (p. 792) refers to the problem of the protection of labourers engaged in the construction of the China-Burma road which traverses highly malarious districts. Immediate measures include the provision of nets and screened quarters, insecticidal sprays and quinine prophylaxis; permanent measures are directed to the indigenous population and the protection of labour gangs. WILSON and WILSON (p. 792) describe the measures taken to reduce the breeding of *A. gambiae* in a highly malarious group of coffee estates in Tanganyika Territory. CORRADETTI (p. 793) describes the antimalarial measures in force at the aviation camp of Combolcia, where *A. gambiae* is the vector.

Malaria of Birds and Monkeys—TADDIA and VIERO (p. 793) note that infection with malaria brings about hypertrophy of the reticulo-endothial system. This supports the view that the occurrence of exoerythrocytic schizonts is the result of the presence of greater numbers of phagocytes and is therefore in the nature of an accident. CORRADETTI (p. 793) states that different species of bird malaria

parasites vary in the extent to which exoerythrocytic development takes place. He regards these parasites as having originated from coccidia and as being adapted in various degrees to development in the blood. DE RITIS (p. 794) discusses exoerythrocytic schizonts in *P. gallinaceum* infection of fowls.

MANWELL and GOLDSTEIN (p. 794) have produced passive immunity in birds by injecting the serum of canaries hyperimmunized against *P. cathemerium*.

RODHAIN and LASSMAN (p. 794) show that *P. schwetzi* resembles the human *P. vivax* not only morphologically but also in its preference for reticulocytes rather than mature erythrocytes.

RODHAIN and VAN HOOF (p. 795) discuss the behaviour of the plasmodia of monkeys in various mosquitoes.

FULTON (p. 795) shows that the aromatic amidines have a definite action against *P. knowlesi*, and inhibit oxygen uptake. Against *P. relictum* of birds one preparation was inactive but the other showed some activity. *C. W.*

BAISAS (F. E.). **Malaria in Southern Abra.**—*Monthly Bull. Bureau of Health.* Manila. 1939. Oct. Vol. 19. No. 10. pp. 393–406. With 7 figs.

Abra is in Northern Luzon, Philippine Islands. For the greater part it consists of rocky mountains and hills. The population of Southern Abra is composed mainly of Tingians, a primitive people now being christianized, and a lesser number of Ilocano settlers. Malaria was apparently very mildly endemic until November 1938 when a severe epidemic, lasting three to four months, was experienced. The author made a short reconnaissance of the malaria situation in February 1939, when the epidemic was on the wane. He records his observations on spleen and parasite rates and on mosquito larvae collected. The causes of the epidemic remain obscure. There was an extension of irrigation in 1938 for the purpose of obtaining two crops of rice a year, but there were places in which irrigation ditches were completely dry during the summer and which suffered as severely as any other. The author's observations did not reveal any marked prevalence of *A. flavirostris*, the supposed vector. Control measures will be more than usually difficult in Southern Abra in which easy means of communication are non-existent, and travel is impossible in the rainy season. Road construction is an essential preliminary to public health work : dispensaries should be established to take care of the sick. *Norman White.*

RUSSELL (P. F.), SWEET (W. C.) & MENON (M. K.). **Some Observations on Malaria Parasite Rates in Infants in South India.**—*Jl. Malaria Inst. of India.* 1939. Dec. Vol. 2. No. 4. pp. 439–455. With 1 chart.

Observations were made in two contrasting areas, (1) three communities in Mysore where malaria transmission may take place throughout the year and where malaria has been long prevalent, and (2) Pattukkottai Taluk in the Madras Presidency, where the malaria season is determined by the irrigation season and where malaria is of recent introduction, 1933. In the Mysore area infant malaria rates were lower than the rates in children ; the youngest infant found infected was six months old. There was no evidence that any month

was unfavourable for transmission though the most favourable period appeared to be October to March. The species of parasites found in infants were *P. vivax* 40, *P. falciparum* 33, and *P. malariae* 27 per cent. Gametocytes were found in 46·7 per cent. of the positive infant smears. *P. falciparum* transmission may occur mainly in the cooler season, *P. malariae* transmission mainly in the hot season.

In the Pattukkottai Taluk 1,087 infants were examined during four surveys: the parasite rate of these infants was 6·2 per cent. No infant in the first month of life was found infected; several infants two months old were infected. There was no evidence of general immunity in infants from 2 to 5 months old. The transmission season extended from July to January. *P. falciparum* infections formed three-quarters of the total infant infections, the remainder being due to *P. vivax*. *N. W.*

YOUNG (Martin D.), STUBBS (Trawick H.) & COATNEY (G. Robert). **Studies on Induced Quartan Malaria in Negro Paretics. I. Periodic Phenomena of the Asexual Cycle.**—*Amer. Jl. Hyg.* 1940. Mar. Vol. 31. No. 2. Sect. C. pp. 51–59. With 3 figs.

The observations recorded were made on four Negro patients infected by direct intravenous inoculation of 5 cc. of whole blood containing parasites of a strain of *P. malariae* that has been employed since 1932 for malaria therapy. The strain regularly produces infection with 20 to 40 paroxysms and it seldom breaks up into more than one brood of parasites; incubation periods vary from 10 days to one month or more. In these four patients smears were made every six hours during the course of infection; on the day of the paroxysm and on the day preceding it smears were made more frequently, often at hourly intervals. Rectal temperatures were recorded four-hourly: when the temperature exceeded 100° F. the temperature was recorded every hour. In examining the films usually 100 parasites were counted. They were recorded as rings, forms less than half the size of the red cell, and larger forms. The older parasites were recorded according to the number of chromatin masses they contained, which varied from 2 to 12. These 14 stages formed 3 groups: trophozoites with single chromatin masses; young schizonts with from 2 to 5 chromatin masses, and segmenters with 6 or more chromatin masses. Altogether more than 30,000 parasites were recorded.

The strain of *P. malariae* studied possesses a high degree of synchronicity: the asexual cycle was repeated every 72 hours. The duration of the growth stages was trophozoite 54·2 hours; young schizonts 10·4 hours, and segmenters 7·4 hours. The process of segmentation lasted about six hours. The rise of temperature closely followed the progress of segmentation: it reached its height at the end of this process. *N. W.*

BUONOMINI (Giulio). Nuove acquisizioni sullo sviluppo dei parassiti malarici. [**Development of Malarial Parasites.**]—*Settimana Med.* Palermo (formerly *Riv. Sanitaria Siciliana*). 1940. Mar. 9. Vol. 28. No. 10. pp. 239–40, 243–6. With 8 figs. on 1 plate. [17 refs.]

This is a review of recently acquired knowledge on the subject of schizogony of malarial parasites with special reference to the development and function of the exoerythrocytic schizonts. The paper appears to describe no new observations. *C. M. Wenyon.*

VARGAS (A.) & FREIRE (F.). Novos processos para avaliar a área de vôos dos anofeles. [**New Methods of measuring the Range of Flight of Anopheles.**]—*Ann. Paulist. Med. e Cirurg.* 1940. Jan. Vol. 39. No. 1. pp. 3–7.

The authors have carried out experiments with a method described by WEATHERSBEE and HASELL [see this *Bulletin*, 1939, Vol. 36, p. 137]. Mosquito larvae are placed in dilute stains: the dye persists into the adult stage. They found that an immersion of the larvae in a solution of methylene blue, from ½ to ¼ per mille, for from 18 to 48 hours, is sufficient to colour the thorax and abdomen of the adult mosquitoes developing therefrom. They found that some anopheline larvae can live for days in a ¼ per 1,000 solution of methylene blue, thereafter completing their development into coloured adults. This observation prompted an attempt at colouring natural breeding places with the idea of measuring the range of dispersal of the Anopheles emerging therefrom. On one or two occasions it was possible by this means to obtain recognizably coloured Aëdes and Culex, but *A. argyritarsis* and *A. tarsimaculatus* showed no evident stain. Thereafter anopheline larvae were kept for 48 hours in a solution of methylene blue in the laboratory and then returned to their original breeding places. This method was successful. *N. W.*

CAMBOURNAC (F. J. C.) & HILL (R. B.). **The Biology of** *Anopheles maculipennis*, **var.** *atroparvus* **in Portugal.**—*Acta Conv. ter. Malar. Morb.* Amsterdam. 1938. Vol. 2. pp. 178–184. [Summarized in *Rev. Applied Entom.* Ser. B. 1940. July. Vol. 28. Pt. 7. pp. 117–119.]

"In Portugal, *Anopheles maculipennis*, Mg., race *atroparvus*, van Thiel, is responsible for the transmission of hyperendemic malaria in some areas and for sporadic outbreaks in others, whereas it is present in still other areas where malaria is unknown. For this reason, special attention has been paid to its biology under different conditions, and in this paper are summarised the results of observations over a period of 5 years, with special reference to the hyperendemic area of Aguas de Moura.

"Although appreciable variations in the morphology of the egg occur in the same locality and even in the same batch of eggs, the pattern and type of float are essentially those described by van Thiel and other authors for this race. The length and width of the egg, length of float and relation of float-length to egg-length vary considerably in the same batch. In one batch from a female caught in nature the float-length varied from 19 to 41 per cent. of the total egg-length and in another from 22 to 45 per cent. On the average, the float-length is about 34 per cent., and in most batches the variation is approximately 10 per cent. The larval and adult characters are similar to those described by other authors, but again considerable variations were found in each of the characters commonly used for classification.

"The larvae develop in practically all clean waters with a negative bio-chemical oxygen demand and a *p*H between 6 and 8, provided that there is sunlight, some vegetation and little or no current. Such waters include swamps, canals, irrigation and drainage ditches and other semi-permanent collections of water, especially rice-fields. In rice-fields, the concentration of larvae is greater than elsewhere,

and on account of their extent they produce at least 90 per cent. of all Anophelines in Portugal. They are flooded from May to September and so constitute a source of adults throughout the malaria season. The larvae can withstand, and may even be favoured by, relatively high temperatures. Three years' observations have shown that the temperature of the water in rice-fields at 4 o'clock in summer varies from 24 to 32°C. [75·2 to 89·6°F.], with means of 27, 29 and 26°C. [80·6, 84·2 and 78·8°F.] for June, July and August, respectively. Though breeding is prolific near tide water, where many rice-fields are situated, it occurs only in fresh water. The larvae are found in water with a total chloride content of between 50 and 130 mg. per litre. When the salinity rises, they are replaced by larvae of the genus *Aëdes*, but they appear again when the salinity is reduced to 170 mg. Under laboratory conditions, adults may be obtained from larvae reared in water containing up to 0·8 per cent. sodium chloride, but the larval mortality is high and development is prolonged.

"At room temperatures in the spring and summer, about 80 per cent. of the gravid females caught in nature will oviposit in small vials. The percentage diminishes in September, and is only about 3 during November–January. It rises suddenly to 70 about the middle of February. In nature, a few scattered eggs and larvae are found in January, but they do not appear in any numbers until the middle of February. The first males appear at the beginning of March and the last ones die in December. In the relatively mild climate, in which the temperature falls to 0°C. [32°F.] only for short periods, the females do not usually hibernate. During September, fat begins to develop, and oviposition is suspended in October, when approximately 4 per cent. of the females contain both fat and partly-developed eggs in which further growth is suspended. Females taking refuge in well-built and relatively warm inhabited stables and rabbit hutches increase in numbers until January. They are not found in houses or attics during the autumn and winter or even in spring until the new generations appear. During relatively warm winter days, feeding takes place and movement into the open occurs. In two rabbit pens where all the Anophelines were caught each week for three years, the population was renewed each week in both winter and summer. Females caught in nature about the middle of October or bred in the laboratory (the latter either infected with *Plasmodium* or not) survived the winter in small cages, whether unfed or given a weekly blood meal. Most of them died off suddenly towards the end of January, but a few survived until the last week in May. In nature, there is also a sudden falling off in the numbers in shelters at the end of January, but many survive, and those captured live as long as those kept in cages through the winter. Overwintered females, after taking a blood meal in spring, laid from 2 to 4 batches of viable eggs.

"In spring, the life-cycle from egg to adult lasts about 30 days, but in summer the average is 18 days; 6–7 generations occur in a year. In rice-fields, the number of larvae increases up to June, when the average number per square metre was 400. This number falls to 100 in July and 70 in August. A similar decrease occurred in the numbers of adults caught as the summer advanced. The length of life of the adult, whether infected or uninfected, varied from 7 months in winter to about 2 months in summer. The adults are extremely resistant to high temperatures. Their preferred shelters are sheds containing animals, but if they are very abundant, they invade all shelters and

in this way some find their way into houses. They feed under cover or near shelters, but never in the open; repeated attempts to catch females with human or animal bait in the open fields or in the vicinity of rice-fields invariably failed. The flight range of the female when hungry is at least 3 kilometres, but after feeding it can fly with difficulty only a few yards. Most females feed after dusk, but the race in the region of Aguas de Moura does not necessarily feed only at night, and in subdued light will attack man and animals at any time of the day. Although the blood of rabbits, horses and pigs, in that order, is preferred, all the usual domestic animals and man are attacked when hosts are relatively scarce. The tendency of this Anopheline to take any available food, together with the chance selection of houses for shelter, would appear to be largely responsible for the continuance of hyper-endemic malaria. When its density is high, malaria is endemic; when its density is low, the small numbers attacking man make it an inefficient vector. Thus its capacity as a vector depends largely on its abundance."

WEYER (Fr.). Zur Frage der Konstanz in der Zusammensetzung natürlicher Populationen von *Anopheles maculipennis*. [**Constancy in the Racial Composition of** *A. maculipennis* **Populations.**]—*Ztschr. f. Parasitenk.* 1939. Dec. 21. Vol. 11. No. 2 & 3. pp. 357–370.

In the course of eight years, in numerous localities in North Germany, no fundamental change has been detected in the races which compose the population of *A. maculipennis*.

Since the various races of *A. maculipennis* are now well recognized entities differing in their relation to malaria, it is important to know, in a given locality, whether the composition of the population is remaining constant or whether one race is increasing at the expense of the others. The races differ from one another in their choice of host and of resting place, and in the ease with which they are obtained at different seasons of the year. They may be differently affected by abnormal drought or flooding, etc. Great care is therefore necessary if the observer is not to be misled. As already stated, in the course of observations extending in some places over 8 years, in which these sources of error were taken into account, no change could be detected in a series of localities in North Germany. *V. B. Wigglesworth.*

WISEMAN (R. H.), SYMES (C. B.), MCMAHON (J. C.) & TEESDALE (C.). **Report on a Malaria Survey of Mombasa.**—60 pp. With 3 plates, 1 folding plan & 3 figs. 1939. Nairobi. [Summarized in *Rev. Applied Entom.* Ser. B. 1940. July. Vol. 28. Pt. 7. pp. 114–116.]

"Although the incidence of malaria at Mombasa has decreased appreciably during recent years, cases still occur occasionally in some numbers. A detailed account is given of malaria and mosquito surveys carried out from May 1936 to May 1937 as a preliminary to evolving a comprehensive scheme for dealing with the problem of this 'residual' malaria. Information was also collected during the mosquito survey on the prevalence of *Aëdes aegypti*, L., in connection with the possible introduction of yellow fever, particularly since Mombasa has been made a port of call for the Imperial Airways Flying Boat Service between Europe and South Africa.

"The clinical survey indicated that the incidence of malaria is high; the high spleen and parasite rates and the fact that they were higher in children than in adults indicated an acute exacerbation of an endemic situation. On the island, the incidence is greatest in the two main African areas; on the mainland, the general incidence is very high. The monthly incidence shows a peak period in May–August, following the long rains, and a smaller secondary wave in December and January, following the short rains.

"The work on mosquitos included searches for breeding places in land not included in house compounds ('outside' breeding places), in houses and their compounds, in wells and in tree holes; searches for adults in and around houses and in bush and other natural harbourages out of doors; a staining experiment to ascertain whether it was possible for the island to be invaded by adults from the mainland; a small number of dissections to determine the rate of infectivity; and examination of mail trains arriving at Mombasa, to determine the part they play in introducing mosquitos.

"The 61 species of mosquitos recorded included 7 Anophelines. *Aëdes aegypti* was by far the most prevalent species in Mombasa; the larvae occurred in 33 per cent. of the outside breeding places, 9 per cent. of those in houses or compounds on the island and 19 per cent. of similar ones on the mainland, and were also obtained from trees, banana and pineapple plants and occasionally wells. Larvae of *Anopheles gambiae*, Giles, occurred in 1·6 per cent. of the outside breeding places on the island and in 11 per cent. of those on the mainland. They were found on 12 occasions in artificial containers and in 1·4 per cent. of the wells searched. The adults occurred in nearly 6 per cent. of the houses visited on the mainland, but were rare in those on the island; considerable numbers were brought into the town by train. The infectivity rate for the year was 3·1 per cent. Small numbers of larvae of *A. funestus*, Giles, were found in natural waters and in wells on the mainland and a few adults in houses; it is assumed, however, that the population of this species is much larger than is suggested by the numbers collected. *A. gambiae* and *A. funestus*, which were the only Anophelines present in houses, are undoubtedly the vectors of malaria in Mombasa, the former being responsible for all the cases on the island and for most of those on the mainland. *Culex fatigans*, Wied., was the commonest mosquito in houses; it bred in a variety of water containers and most abundantly in pit latrines; it is known to be a carrier of *Filaria* (*Wuchereria*) *bancrofti* elsewhere, and as this disease occurs both up and down the coast, there is little reason to doubt that it is a vector in Mombasa.

"Of the species of mosquitos that have been shown experimentally to transmit yellow fever or to harbour the virus, *Aëdes simpsoni*, Theo., *A. vittatus*, Big., *Eretmapodites chrysogaster*, Graham, *Mansonia* (*Taeniorhynchus*) *africanus*, Theo., *M.* (*T.*) *uniformis*, Theo., and *Culex thalassius*, Theo., have been taken in Mombasa. If a mosquito infected with yellow fever were brought to Mombasa, with its dense population of susceptible persons and its abundant vectors, there would not only be a major catastrophe, but the damage to the country's sea trade would be almost irreparable. The coastal districts would almost certainly become endemic areas, since monkeys, which may act as reservoirs, are present and possible vectors are plentiful. It is believed that the measure most likely to afford protection from yellow fever is the eradication of mosquitos in and near airports. The fact

that *A. aegypti* is also a vector of dengue, which occurs in neighbouring countries, is regarded as an additional reason for its control.

"Recommendations are made for eliminating the breeding places of the actually or potentially dangerous mosquitos, and it is suggested that measures should be taken for the destruction of adults in trains and aircraft. In addition to such usual operations as filling and draining, oiling, and dusting with Paris green, the recommendations include the filling of rot-holes in trees, preventing the accumulation of water in the steps cut in the trunks of coconut palms by cutting V-shaped drainage channels in them, the provision of mosquito-proof covers for wells, and the periodic clearing of vegetation to facilitate the removal of all water-holding refuse. Experiments with stained mosquitos showed that *A. aegypti* and certain other mosquitos can reach the island from the mainland, and there is no reason to suppose that *A. gambiae*, which is a strong flyer, cannot do so too."

ADAMS (P. C. G.). **Some Observations on the Flight of Stained Anophelines at N'Kana, Northern Rhodesia.**—*Ann. Trop. Med. & Parasit.* 1940. Apr. 30. Vol. 34. No. 1. pp. 35–43. With 1 sketch map.

N'Kana is a copper-mining township in Northern Rhodesia. Despite efficient anti-larval measures carried out over a radius of half a mile from the edge of the inhabited area adult anophelines were constantly found in the native huts in the control area. The author has shown that the source of many of these anophelines is the Kafue River three miles eastward; the winds prevail from the river across N'Kana. Such considerations prompted the observations on the flight of stained mosquitoes reported. *A. funestus* can travel as far as 4·5 miles down wind, the same distance at an angle of 45° to wind, 1·5 miles at an angle of 30° up-wind, and 1·8 miles at right-angles to wind. *A. gambiae* can travel 4·25 miles down wind, and 1·50 miles at a right-angle to wind. The method of combating dangers arising from such prolonged flights is either the removal of the source of infection from proximity to the production-area, or adult-control at the source of infection, and in larval controlled areas. [See also this *Bulletin*, 1940, Vol. 37, p. 287.] *N. W.*

HINMAN (E. Harold) & HURLBUT (H. S.). **A Study of Winter Activities and Hibernation of *Anopheles quadrimaculatus* in the Tennessee Valley.**—*Amer. Jl. Trop. Med.* 1940. May. Vol. 20. No. 3. pp. 431–446. With 2 plates. [10 refs.]

In the Tennessee Valley *A. quadrimaculatus* passes the winter solely as a hibernating female after insemination. Fat is stored in the autumn and gradually used up during the winter; hibernation lasting from late November to early February. If such females are exposed to temperatures above 68°F. blood meals are taken and ovarian development is resumed. Oöcysts were discovered in one specimen found in a cave in early December. *V. B. Wigglesworth.*

HINMAN (E. Harold) & HURLBUT (Herbert S.). **The Relation of Shade to *Anopheles quadrimaculatus* Breeding—a Preliminary Report.**—*Jl. Parasitology.* 1940. Apr. Vol. 26. No. 2. pp. 145–156. With 3 figs.

Shading the breeding places seems to have little effect on *Anopheles quadrimaculatus.*

Several species of *Anopheles* can be effectively controlled by shading their breeding places; notably the stream breeder *A. minimus* in Assam and the sunlight loving species *A. gambiae* in Africa. The authors have therefore studied the effect of shade on the breeding of *A. quadrimaculatus* in certain reservoirs in the Tennessee Valley. Two species of "aquatic" trees native to the area have been planted round several reservoirs, but their effect will not be known for many years. Comparison in different localities showed that the intensity of breeding was less in densely shaded waters, but it was never entirely prevented. Artificial shade established by supporting a tarpaulin over a natural breeding place reduced the number of larvae present but failed to eliminate them. In the laboratory, *A. quadrimaculatus* has been reared in complete darkness. It appears, therefore, that shading is not likely to be entirely effective against this species.

V. B. Wigglesworth.

VARGAS (Luis). Clave para identificar las larvas de Anopheles Mexicanos. [**Key to the Larvae of Mexican Anopheles.**]—Reprinted from *Ciencia.* 1940. Apr. 1. Vol. 1. No. 2. pp. 66–68.

DEL PONTE (Eduardo). Observaciones sobre *Anopheles pseudopunctipennis* en la Mendieta. [*A. pseudopunctipennis* **in La Mendieta.**]—*Bol. Sanitario.* Buenos Aires. 1939. Sept. Vol. 3. No. 9. pp. 571–577.

BLACK (J. B.). **The Accidental Transmission of Malaria through Intravenous Injections of Neoarsphenamine.**—*Amer. Jl. Hyg.* 1940. Mar. Vol. 31. No. 2. Sect. C. pp. 37–42. [25 refs.]

There was an unduly high proportion of malaria infections among patients attending a syphilis clinic in the out-patient department of a hospital in Rutherford County, Tennessee. Investigation showed that infection was being transmitted by the method used in giving intravenous neoarsphenamine injections. A glass percolator and rubber tubing, into the distal end of which a needle was inserted, were used. A small piece of glass tubing near the insertion of the needle formed a window. A fresh needle was used for each patient, but after the needle had been inserted into the vein, blood was allowed to flow back to the window to ensure that the point of the needle was in the lumen of the vein. The drug was then injected by gravity. There was thus a possibility of the injection being contaminated with blood adhering to the inside of the glass tubing. Since the method was replaced by the use of a fresh sterile syringe for each patient the undue prevalence of malaria among patients attending the clinic has been entirely eliminated. [An almost exactly similar occurrence was reported by WENYON in 1926 (*Protozoology*, p. 955).] *N. W.*

CHUNG (Huei-lan), LIU (W. T.), WANG (C. W.) & CHU (Irving). **Transmission of Malaria among Drug Addicts in Peiping. Demonstration of Malarial Parasites in Syringes used for Intravenous Injections of Heroin.**—*Chinese Med. Jl.* 1940. Jan. Vol. 57. No. 1. pp. 32–38. With 8 figs. on 3 plates. [15 refs.]

The authors report cases of malaria among heroin addicts. They describe the method employed in three heroin dens in giving intravenous injections of the narcotic to the unfortunate victims, a method devoid

of any antiseptic or aseptic precaution. Confirmation of the *primâ facie* assumption that infection of malaria, and of other diseases, might be transmitted through the common use of hypodermic syringes and needles, was afforded by finding crescents and ring forms of *P. falciparum* and gametocytes of *P. vivax* in the residual fluid in syringes used in two heroin dens. *N. W.*

SCHILLING (Claus). Immunizzazione contro la malaria. [**Immunization against Malaria.**]—*Rendiconti Istituto di Sanità Pubblica.* Rome. 1939. Vol. 2. Pt. 3. pp. 955–972. [20 refs.]

This is an amplification of the author's work summarized in this *Bulletin*, 1940, Vol. 37, pp. 366–367. A detailed description is given of the methods adopted in giving schizont and sporozoite inoculations. The author concludes that adult man has a natural resistance against a minimal number of both schizonts and sporozoites of the Madagascar strain of *P. vivax*. The subcutaneous inoculation of increasing doses of schizonts can confer a high degree of resistance against schizonts: a dose as high as 80,000 schizonts may be resisted. Man is much more sensitive to the subcutaneous inoculation of sporozoites than of schizonts. The value of sporozoites as antigen is uncertain and is much influenced by individual reaction: the resistance of one patient was much increased by sporozoite inoculations. An immunity against the bites of infective mosquitoes was conferred in one case by a series of inoculations first with schizonts and later with sporozoites. In two cases after the spontaneous recovery of primary attacks sufficient resistance developed to protect against infective mosquito bites: such resistance can be further increased by sporozoite inoculations. *N. W.*

CANNATA (Roberto). Malaria latente rivelatasi nel decorso di malattie infettive acute. [**Latent Malaria Infections Activated during the Course of Acute Infectious Diseases.**]—*Pediatria.* 1940. Feb. Vol. 48. No. 2. pp. 113–116.

Two cases are described, one of typhoid fever and the other of meningococcal cerebrospinal meningitis, during the course of which unsuspected malaria infections became active. *N. W.*

LERICHE (E.). Manifestations buccales au cours d'accès palustres. [**Buccal Complications of Malaria.**]—*Rev. Méd. Française d'Extrême Orient.* 1939. Nov. No. 9. pp. 1169–1172. Also in *Rev. du Paludisme et de Méd. Trop.* Paris. 1940. Apr. 15. Vol. 2. No. 10. pp. 110–113.

The author calls attention to the occurrence of gingivostomatitis, complicating acute attacks of malaria. Most of such cases are responsive to local treatment but there are others in which the local condition remains refractory until the general condition is ameliorated by specific malaria treatment. Two such cases are described. Should

the stomatitis assume a haemorrhagic form an avitaminosis C should be suspected: lessened resistance caused by malaria may contribute to a manifestation of signs of such deficiency. *N. W.*

CASQUEIRO (Antonio). Post-partum e paludismo. [**Malaria and Pregnancy.**]—*Africa Méd.* Lisbon. 1940. Feb. Vol. 6. No. 2. pp. 33–38.

The author reports that post-partum retraction of the uterus may be much delayed in malarial subjects. He describes several cases of such delayed retraction, with the haemorrhage and other symptoms to which the condition may give rise. The administration of anti-malarial remedies rapidly rectifies the condition. The importance of prompt recognition of the malaria infection is stressed. *N. W.*

CRAIG (Charles F.). **The "Short-Term" Treatment of Malarial Infections with Quinine.**—*Amer. Jl. Trop. Med.* 1940. Mar. Vol. 20. No. 2. pp. 239–248. [16 refs.]

This is a very energetic protest against the adoption of the "short-term" treatment of malaria with quinine. The author maintains that there is no adequate evidence that it results in either an efficient premunition or an immunity. It is dangerous inasmuch as it does not prevent the development of pernicious symptoms in *P. falciparum* infections. It favours transmission through favouring the development of carriers and thus perpetuates infections. The aim of the physician in the treatment of malaria with quinine should be to eliminate infection: the vast majority of malarial infections can be eliminated by the administration of quinine in adequate doses for a considerable length of time. *N. W.*

BANERJEA (A. C.). **Note on the Manufacture and Retail Sale of Quinine Tablets in the Rural Areas of the United Provinces.**—*Jl. Malaria Inst. of India.* 1939. Dec. Vol. 2. No. 4. pp. 377–386. With 8 figs. on 4 plates & 1 map.

The practical importance of, and the difficulties attendant on, making quinine available to the rural populations of malaria-stricken countries endow this paper with interest. It describes the procedure now in force in the United Provinces where the annual sales of quinine during the last six years have increased from 500 to 5,000 lb. The installation of modern power-driven machinery has resulted in a reduction in the cost of the conversion of quinine powder into tablets from Rs. 12 to Rs. 4 per lb. It has also enabled a standardization of the alkaloid content of the tablets. One anna grease-paper packets, each containing 5 tablets of three grains, can be bought at about 2,500 post offices, or from rural postmen who visit even the remotest villages. The selling agent makes a profit of 10 annas on each box of packets for which he pays Rs. 5. Attempts are being made to enlarge the selling agency. *N. W.*

VANSELOW (Joachim-Dieter). Ueber die Bedeutung des Atebrins für die Malariabehandlung und -vorbeugung. [**The Value of Atebrin in the Treatment and Prophylaxis of Malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1940. May. Vol. 44. No. 5. pp. 199–221. [3 pages of refs.]

ROBERTSON (R. Cecil). **Malaria in Western Yunnan with Reference to the China-Burma Highway.**—*Chinese Med. Jl.* 1940. Jan. Vol. 57. No. 1. pp. 57–73. With 1 map.

The new motor highway from Kunming (Yunnanfu) to Lashio in the Northern Shan State was constructed with great rapidity. It traverses country which has for long had an unenviable reputation for malaria, and malaria caused havoc among the labour forces constructing the western section of the road. This report contains interesting, though necessarily incomplete, information concerning malaria conditions along the western end of the highway. Its publication serves to direct attention to precautions and measures which should be taken without delay. The author set up a malaria survey laboratory at Mangshih which is situated in a small agricultural plain about 3,600 feet above sea level and surrounded by mountains. Fourteen species of *Anopheles* were found of which six were shown by dissection to be malaria vectors, *minimus*, *maculatus*, *jeyporiensis*, *culicifacies*, *hyrcanus* var. *sinensis*, and *annularis*. *A. minimus* appears to be the most dangerous vector.

The immediate control measures advocated include the provision of mosquito nets for transport workers; the construction of screened hostels at the vehicle parking places; insecticidal sprays for vehicles in which drivers have to sleep, and quinine prophylaxis. More permanent measures should include health education of the indigenous population, attempts to deparasitize the local Shan population along the western section of the road, medical aid for labour forces, mosquito-proof shelters for labour gangs, placing screened depots of the transport system on suitable sites away from swamps, the provision of mosquito nets of a mesh sufficiently small to exclude *A. minimus*, and the improvement of medical and hospital facilities. *N. W.*

WILSON (D. Bagster) & WILSON (Margaret E.). **Control of *A. gambiae* on Coffee Estates.**—*East African Med. Jl.* 1940. Feb. Vol. 16. No. 11. pp. 405–415. With 2 figs. (1 map).

A group of coffee estates on the slopes of Mount Meru in the Northern Province of Tanganyika Territory, with a population of about 4,150, of which 50 are Europeans, has suffered much from seasonal malaria. Very little money is available for antimalaria measures. A great variety of anopheline breeding occurs but with very rare exceptions *A. gambiae* is the only species found inside houses. Formerly malaria transmission took place during eight months of the year. Over a period of two years anti-larval measures have been undertaken. Oiling has been applied to known or probable *A. gambiae* breeding places. This was applied as far as possible by means of sawdust soaked in oil and scattered by hand. Where this method was not practicable pressure sprayers were used. Borrow pits and pools which were too large to be cheaply filled were packed with cut vegetation. Many earth drains have been dug. The total cost of these control measures was about £12 per square mile. Oiling was commenced immediately following the first finding of adult mosquitoes. The period of oiling, and its effectiveness, were determined by the results of anopheline catches in fixed catching stations. The effect of these measures has been to free the area from malaria transmission for 8–9 months, as compared with 4 months

in the past. Anopheline infestation during the transmission season is only a sixth of its previous level. Anopheline infectivity has been reduced from 4·6 to 3·6 per cent. *N. W.*

CORRADETTI (Augusto). Programme de lutte antipalustre au camp d'aviation de Combolcia pour 1939. Conditions paludéologiques de la plaine de Combolcia. [**Anti-Malaria Measures in Combolcia Aviation Camp during 1939 : Malaria Conditions in the Combolcia Plain.**]—*Bull. Office Internat. d'Hyg. Publique.* 1940. May–June. Vol. 32. No. 5–6. pp. 560–563. With 1 fig.

The malaria season in Combolcia is from September to December. This is the rainy season. *A. gambiae* is the vector. The soil is very slightly permeable, consequently during the rains puddles are innumerable and the whole plain becomes in effect a mosquito-breeding marsh. Airplane dusting with Paris green is the antilarval measure employed over an area of 3 kilometres from the aerodrome. The hopper used for the discharge of the dust from the plane is described and figured. Dusting was carried out once a week from the beginning of August to the end of December. In addition, attention is given to the mosquito-proofing of dwellings, the use of mosquito nets, the destruction of adult mosquitoes with Flit and the administration of prophylactic quinine. *N. W.*

BECKMAN (Harry). **The Prophylaxis of Malaria.**—*Southern Med. Jl.* 1940. May. Vol. 33. No. 5. pp. 516–522. With 1 fig. [24 refs.]

TADDIA (Leo) & VIERO (Giovanni). Ricerche sulle fasi esoeritrocitiche del *Plasmodium relictum.* [**Exoerythrocytic Phases of** *P. relictum.*]—*Riv. di Parassit.* Rome. 1940. Mar. Vol. 4. No. 1. pp. 45–49. With 1 fig. [19 refs.]

The authors have found exoerythrocytic schizonts in birds captured in Venice and found to be infected with *Plasmodium relictum.* Blood from these birds inoculated to canaries produced the same infection associated also with exoerythrocytic schizonts. It was noted that the malarial infection brought about a hypertrophy of the reticulo-endothelial system, a fact which lends support to the view that the occurrence of the exoerythrocytic schizonts is the result of the presence in the body of greater numbers of phagocytic cells and is thus in the nature of an accident. The authors favour the view that these schizonts do not represent an essential stage in the life cycle of the parasite. *C. M. Wenyon.*

CORRADETTI (Augusto). **The Significance of the Exo-Erythrocytic Cycle of Plasmodia.**—Translation of a Lecture read at the University of Rome on January 25th, 1940. 8 pp. [27 refs.]

——. **The Significance of the Exo-Erythrocytic Cycle of Plasmodia.**—*Jl. Trop. Med. & Hyg.* 1940. Apr. 15. Vol. 43 No. 8. pp. 110–113. [27 refs.]

Discussing the exoerythrocytic development of certain bird malarial parasites the author points out that species differ in the degree to

which this development takes place. Thus in species of *Haemoproteus* the schizogony occurs exclusively in cells other than red cells. In *Plasmodium elongatum* most of the development is exoerythrocytic but some schizogony occurs in the red cells, while in many species, as far as is known, the schizogony is exclusively erythrocytic. These blood protozoa are regarded as having originated from coccidia, in which schizogony never occurs in red blood corpuscles, and the varying degree in which erythrocytic schizogony replaces exoerythrocytic schizogony reveals a varying adaptation of coccidia to development in the blood. *C. M. W.*

DE RUTIS (Ferdinando). Sul decorso dell'infezione da *P. gallinaceum* Brumpt, 1935. [**Course of** *P. gallinaceum* **Infection.**]—*Rev. di Parassit.* Rome. 1940. Mar. Vol. 4. No. 1. pp. 61–68.

In a study of *Plasmodium gallinaceum* of fowls the author finds that the incubation period is shortest after intravenous inoculation and longest after subcutaneous inoculation, while intramuscular inoculation holds second place. The exoerythrocytic schizonts were constantly present in fowls dying during the fourth or fifth week of infection and their presence was uninfluenced by the administration of quinine given from the time of the appearance of parasites in the blood. These schizonts were not present in fowls dying after five weeks but the blood of such fowls inoculated to fresh birds gave rise again to infections associated with them. *C. M. W.*

MANWELL (Reginald D.) & GOLDSTEIN (Frederick). **Passive Immunity in Avian Malaria.**—*Jl. Experim. Med.* 1940. Mar. 1. Vol. 71. No. 3. pp. 409–422. With 4 charts. [19 refs.]

By inoculating serum from canaries hyperimmunized against *Plasmodium cathemerium* the authors have been able to confer on healthy birds a passive immunity against the parasite. From the therapeutic point of view the serum is more effective when administered before infection has occurred than when given after. The protective substances, whatever may be their nature, are present in the serum in very low concentration but this can be raised by superinfecting the birds. *C. M. W.*

RODHAIN (J.) & LASSMAN (P.). Le comportement de *Plasmodium schwetzi* (Brumpt) du chimpanzé vis-à-vis des réticulocytes. [**Behaviour of** *P. schwetzi* **of the Chimpanzee in Regard to the Reticulocytes.**]—*Ann. Soc. Belge de Méd. Trop.* 1940. Mar. 31. Vol. 20. No. 1. pp. 83–90.

The authors have had the opportunity of studying a freshly isolated strain of *Plasmodium schwetzi* by inoculation into a chimpanzee of blood from a chimpanzee received in Antwerp in 1939 from the Belgian Congo. This strain differed somewhat from one previously studied and definitely revealed a preference of the young parasites for reticulocytes as against the mature erythrocytes. In this respect the parasite resembles the human *P. vivax* which it resembles so closely morphologically. *C. M. W.*

Bouvier, J. le van Horn. Contribution à l'étude des *Plasmodium* des singes africains. Le comportement différent des *Pl. gonder* et *Pl. koch* chez les moustiques. **The Plasmodia of African Monkeys. Different Behaviour of *P. gonder* and *P. koch* in Mosquitoes.**—*Bull. Soc. Path. Exot.* (Paris), Feb. 14, Vol. 30, No. 2, pp. 107–113.

The common malarial parasite *Plasmodium koch*, of Central African monkeys failed to develop in *Anopheles maculipennis* after eight or five passes. On the other hand *Plasmodium gonder* developed readily in *A. maculipennis* which transmitted infections to monkeys on six times, but it did not develop so readily as the strain of *P. gonder* which was tested at the same time in Europe.

C. M. W.

Fulton, J. D. **The Course of *Plasmodium vivax* Infection in Canaries and the Treatment of Bird and Monkey Malaria with Synthetic Dyes.**—*Ann. Trop. Med. & Parasit.* (Liv.), Apr. 30, Vol. 34, No. 1, pp. 33–46. With 1 chart.

It is shown in this paper that the aromatic amidines 4, 4′-diamidine stilbene and 4, 4′-diamidino-1, 5-diphenoxy pentane, given intravenously, have definite action on *Plasmodium vivax* in the infections with this parasite in canaries which were reduced sub-tertian. The action was similar to that of atoxyl but somewhat slower. Relapses occurred in all but one of eight canaries employed. In the case of bird malaria, the course of which is described in detail from observations on several infected birds infected with *P. vivax*, the stilbene derivative was inactive but the phenoxy-pentane compound delayed the appearance of parasites for a considerable time. The same is the case with the diphenoxy base 1-amino-5-dethylamino pentane, which corresponds to the side chain of pentaquine. As regards the effect of oxygen upside down the drugs tested against monkey malaria had an inhibiting action when tested on the parasites *in vitro*.

C. M. W.

Mesnil, Albert. Morsali nouveau à employer dans le traitement antimalarien. **Biological Methods of testing Antimalarial Drugs.**—*Bulletin Soc. de Sciences Pharmac.* (Paris), 1926, Vol. 2, Pt. 3, pp. 791–798. With 4 figs. & 1 coloured plates.

The paper describes the technique of testing antimalarial drugs and gives details of the methods of handling birds and monkeys for this purpose. In a coloured plate are illustrated *Plasmodium gallinaceum*, trypanosome-like parasites, including what are presumed to be its sporozoites, and other inclusion bodies in the cytoplasm of mononuclear cells of the fowl's blood. Another plate figures various stages of development of *P. vivax*.

C. M. W.

PHYLLOPODA.

Focus of Abstracts in this Section.

Arnold and Swanscombe (p. 797) have estimated the monthly and annual of mass, rice and other cereals. The figure for maize is

low, but the nicotinic acid content of a poor maize diet, associated with pellagra, is greater than that of a typical poor rice diet, and in this respect, therefore, the association of pellagra with maize is not explained. In parboiled rice, the nicotinic acid from the germ and pericarp diffuses throughout the grain and cannot be removed on milling.

NAJJAR and WOOD (p. 798) have found a hitherto unrecognized nicotinic acid derivative in human urine. They give the technique used and suggest that its measurement may be valuable in states of deficiency.

WILLIAMS (p. 798) refers to the many skin conditions which arise from malnutrition and suggests that the name pellagra be reserved for those showing the classical condition. MOORE (p. 798) shows that the syndrome of sore mouth, skin and nervous manifestations, is not due to vitamin B_1 deficiency and that the associated signs, especially dry scaly skin and retrobulbar neuritis, occur in places where there is no deficiency of vitamin A. The syndrome of sore mouth, affections of the skin of the genitals and elsewhere, retrobulbar neuritis, and nervous symptoms should therefore be regarded as of pellagrous origin. MORRIS *et al.* (p. 799) report from China 40 cases of pellagra, in all of which symptoms of beriberi, and in some of which symptoms of deficiency in vitamin A, were also present. Many other patients in the hospital suffered from glossitis which responded to nicotinic acid.

PALLISTER (p. 800) reports a case of pellagra, with skin, mouth and genital lesions and loose stools, in a six-months-old baby in Malaya. A basal pulmonary abscess was also present and the child died.

The same author (p. 801) describes a syndrome found in Chinese in Malaya, which he regards as probably pellagra modified by other factors of diet or circumstances. There is ataxia with "stocking" anaesthesia and pain in the extremities, and the condition bears a close resemblance to the central neuritis of Jamaica described originally by SCOTT.

UPABE (p. 802) sets down the symptoms of pellagra commonly seen in Korea. VAN BOGAERT and VAN DEN BERGHE (p. 802) describe a case of pellagra in a woman in Belgium. Two patients are described by CAMPBELL and ALLISON (p. 803); in one the symptoms suggested a mixture of pellagra and beriberi, in the other they were fairly typical of pellagra. RAMAN (p. 803) details the results of blood examinations, gastric analysis and stool examinations of pellagrous patients in India. GOODALL (p. 804) describes the symptoms found in a number of patients in India, in whom treatment with nicotinic acid was very successful.

BARLOVATZ (p. 804) has found a high incidence of glossitis and angular stomatitis in miners of the Lower Congo. Nicotinic acid is useful in treatment but the best results were obtained from the administration of vitamin B_1. LEWY *et al.* (p. 805) show that certain neurasthenic symptoms of pellagra are not relieved by nicotinic acid amide though many are relieved by thiamin. They now show that cocarboxylase has an effect similar to that of thiamin. SMITH and MARTIN (p. 806) report four cases of cheilosis successfully treated with synthetic vitamin B_6.

GOLDSMITH *et al.* (p. 806) describe ascorbic acid tolerance tests used in the investigations of cases of pellagra. Deficiency in ascorbic acid is not uncommon in pellagra and clinical improvement is rapid on appropriate diet and 200–300 mgm. ascorbic acid daily. *C. W.*

AYKROYD (W. R.) & SWAMINATHAN (M.). **The Nicotinic-Acid Content of Cereals and Pellagra.**—*Indian Jl. Med. Res.* 1940. Jan. Vol. 27. No. 3. pp. 667–677. With 2 charts. [11 refs.]

In view of the old commonly held idea that pellagra occurred endemically only among maize-eating (as opposed to rice eating) peoples and of the prominence recently accorded to nicotinic acid in relation to the disease, the authors decided to estimate the nicotinic acid content of maize, rice and other cereals. Using the cyanogen bromide method of Swaminathan, values have been obtained for cereals in various states of preparation. The results were apparently contrary to what might have been expected, and no explanation was found associating pellagra with maize consumption. It was further shown that this was true not only of Indian grown maize but also for maize grown in endemic areas of Rumania and the United States. The loss of nicotinic acid which occurs during preparation as food is interestingly brought out and the further point is made that the Rumanian pellagrin's diet has a higher nicotinic acid content than that of non-pellagrous Indians.

It is not possible to give the tables of figures published but the authors' own conclusions may be quoted :—

" 1. The nicotinic acid of a number of cereals and cereal products has been determined by the cyanogen-bromide method. Whole wheat was found to stand the highest. Home-pounded raw and parboiled rice, milled parboiled rice, and barley came next in order. Maize, milled raw rice, and the various millets gave low value of a similar order.

" 2. Maize obtained from parts of the United States and Roumania, where pellagra is known to occur, was found to have a nicotinic-acid content similar to that of Indian maize. Maize obtained from Roumanian families containing cases of pellagra did not give lower values than other samples.

" 3. The nicotinic acid present in rice is concentrated in the germ and pericarp. When rice is parboiled, nicotinic acid diffuses through the grain and cannot be removed on milling. Washing and cooking may remove some 50 per cent. of the nicotinic acid present in rice.

" 4. The nicotinic-acid content of a poor maize diet associated with pellagra and of a typical poor rice diet was compared. The latter was estimated to contain less nicotinic acid than the former. Comparison of the nicotinic-acid content of poor rice and maize diets, as determined by the cyanogen-bromide method, thus fails to explain the association of pellagra and maize."

H. S. Stannus.

WAISMAN (Harry A.), MICKELSEN (Olaf), MCKIBBIN (J. M.) & ELVEHJEM (C. A.). **Nicotinic Acid Potency of Food Materials and Certain Chemical Compounds.**—*Jl. Nutrition.* 1940. May 10. Vol. 19. No. 5. pp. 483–492. With 1 fig. [21 refs.]

KODICEK (E.). **Estimation of Nicotinic Acid in Animal Tissues, Blood and Certain Foodstuffs. 1. Method.**—*Biochem. Jl.* 1940. May. Vol. 34. No. 5. pp. 712–723. With 8 figs. [26 refs.]

KODICEK (E.). **Estimation of Nicotinic Acid in Animal Tissues, Blood and Certain Foodstuffs. 2. Applications.**—*Biochem. Jl.* 1940. May. Vol. 34. No. 5. pp. 724–735. [14 refs.]

NAJJAR (Victor A.) & WOOD (Robert W.). **Presence of a hitherto Unrecognized Nicotinic Acid Derivative in Human Urine.**—*Proc. Soc. Experim. Biol. & Med.* 1940. June. Vol. 44. No. 2. pp. 386–390. With 2 figs.

"In the course of some studies on the excretion of thiamin in urine by means of the thiochrome method, using the procedure of Hennessy and Cerecedo (*J. Am. Chem. Soc.*, 1939, Vol. 61, p. 179) it was noted that treatment of the KCl eluate of urine with alkali, even in the absence of ferricyanide, yielded a small amount of a substance soluble in butyl alcohol which gave a bluish fluorescence with ultraviolet light. This fluorescence could be distinguished from that given by thiochrome even with the naked eye, being a whitish blue without any tinge of violet."

The substance was found to be excreted in promptly increased quantity after the ingestion of nicotinic acid. Examination of 27 different pyridine derivatives failed to identity any of them with this substance and spectroscopic examination indicated that it was not a porphyrin. It is probably an excretion product of nicotinic acid and its measurement may prove of value in states of nicotinic acid deficiency in man. Details of technique and of the daily output in normal persons are given. *C. W.*

WILLIAMS (Cicely D.). **What is Pellagra in Children ?**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. June 27. Vol. 34. No. 1. pp. 85–90. With 6 figs. on 4 plates. [19 refs.]

In this article Miss Williams has set down her confession of faith or rather confession of want of faith in regard to pellagra in children. Reference is made to the conditions met with in children in various parts of the world (conditions which have been noticed in this *Bulletin* during the past few years) and to her difficulties in classifying them. She says :—

"In conclusion I venture to suggest that many and various are the forms of malnutrition, and many and various are the skin conditions arising therefrom. There is nothing to prevent a mixture of nutritional diseases in the same individual, hence the appearance of many puzzling and indeterminate conditions."

Such a suggestion is not new but the further suggestion that :—

"The name pellagra had better be reserved for the classical condition, while any other dermatitis which is suspected of a nutritional antecedent we might, as a compromise, refer to as the Pellagroid of Procrustes."

will probably not meet with general approval. *H. S. S.*

MOORE (D. Fitzgerald). **Pellagra or Pellagra-like Conditions in Association with Deficiency of Vitamin A.**—*Jl. Trop. Med. & Hyg.* 1940. July 15. Vol. 43. No. 14. pp. 190–194. [58 refs.]

The author, after alluding to the Colonial Advisory and Nutritional Diseases League of Nations Reports of 1937, states that "much of the research which has been undertaken in the tropics has been of an individual nature and some findings expressed more as a personal view point than as collective evidence. Presented collectively, therefore, they may prove frankly conflicting." In the report referred to it is stated that "other manifestations of vitamin A [deficiency], affecting the mouth and skin, have been noted in Ceylon and West Africa . . . ."

Dr. Moore then proceeds to discuss the syndrome of sore-mouth and its associated signs—sore tongue and lips, skin manifestations, nervous symptoms, etc. To begin with there seems to be in more recent years a general consensus that they respond to autoclaved marmite (the PP factor) and are therefore not due to a vitamin B_1 deficiency.

Of the associated signs some appear to be fairly constantly seen, others less frequently found, or, according to the reports by observers in certain countries, always absent. A dry scaly skin has been described as due to a vitamin A deficiency but it occurs in pellagra [and scurvy]; it is also a common manifestation in the condition described by the author in Nigeria where there is no lack of vitamin A.

The affection of the skin of the scrotum so characteristically seen in pellagrins in America [and in Africa] is said by ELLINGER not to occur in Egypt. It is, however, a part of the symptom-complex described by LANDOR and PALLISTER in the east in which other symptoms of pellagra are stated not to occur. The follicular keratosis which may be noted in pellagra may also occur without signs of pellagra. It has been ascribed to a vitamin A deficiency and may be associated with accepted signs of that state. On the other hand the condition may be absent in cases exhibiting those signs. It may or may not be associated with sore tongue. Defects of vision may also be seen accompanying sore tongue. The defective vision is commonly ascribed to a retrobulbar neuritis which in many cases is followed by optic atrophy. The condition may or may not be associated with keratomalacia and other signs of vitamin A deficiency; some observers of course believe that vitamin A deficiency may occur with no ocular manifestations. That the visual defect is not due to a vitamin A deficiency seems proved by the observations of the author in Nigeria. In a valuable series of papers contributed over a number of years Dr. Fitzgerald Moore has shown that the loss of central acuity of vision, due to a retrobulbar neuritis followed by partial atrophy, occurs in a native population among whom there is no lack of vitamin A—this vitamin being amply provided by the red palm oil which forms a normal and valuable article of diet. In Nigeria, xerophthalmia and keratomalacia do not occur but the visual symptoms referred to above are preceded or accompanied by sore tongue, mouth and lips, affections of the skin of the genitals and elsewhere together with nervous symptoms.

In conclusion the author holds that the older belief in a vitamin A deficiency as the cause of this syndrome, as stated in the League of Nations Report, must give place to an acceptance of their pellagrous origin. *H. S. S.*

MORRIS (H. H.), HWANG (M. S.) & KUO (P. T.). **Pellagra among the War Refugees in Shanghai: its Associated Deficiencies and Nicotinic Acid Treatment.**—*Chinese Med. Jl.* 1940. May. Vol. 57. No. 5. pp. 427–441. With 3 figs. [51 refs.]

References to pellagra in China do not appear to have been published before 1920, since when something under a dozen papers have appeared on the subject. Recently during ten months forty cases of pellagra have been admitted to the hospital for the Shanghai Refugee Camps, where they had been living for a couple of years on an inadequate diet consisting of "congee [?] and rice with small amounts of salted

vegetables at irregular intervals and salted meat and fish very occasionally."

All forty cases exhibited dermatitis and glossitis, with dementia in five cases, though the chief complaint on admission was of diarrhoea or oedema and in a few cases numbness of the extremities. On examination it was determined that all the forty had signs of beriberi. A fifth of the cases also had symptoms referred to by the authors as due to vitamin A deficiency—night blindness, xerophthalmia, keratomalacia, loss of sight, and horny cutaneous eruptions—the ophthalmic and cutaneous manifestations not necessarily being present in the same cases. [A fact worthy of note.] The oedema in these Chinese cases was of the nutritional oedema type associated with hypoproteinaemia. Several cases showed angular stomatitis. All showed low ascorbic acid blood levels but none signs of scurvy. In all hypo- or anacidity and some degree of microcytic hypochromic anaemia were demonstrated. By sternal puncture it was found that pro-myelocytes, pro-erythroblasts, pro-megaloblasts and megaloblasts were present in varying numbers and remained unchanged by treatment ; there was no tendency towards a megalocytic hyperplasia.

Nicotinic acid proved curative for the glossitis, dermatitis and dementia ; it was used in daily doses of 40–120 mgm., parenterally for the sake of economy.

Almost more interesting than these cases of pellagra is the fact mentioned by the authors that 10–20 per cent. of other patients in the wards of the hospital exhibited a glossitis which responded to nicotinic acid while in as many as 60 per cent. complaint was made of abdominal discomfort, burning sensations in various parts of the body, vertigo, nervousness, palpitation, distractability, etc.

[No mention is made, unfortunately, of the total number of the refugee population whence these forty cases were drawn, so that no idea of the incidence of the condition can be obtained. No mention is made one way or another of any affection of the skin of the scrotum and other points of interest receive no comment. In a paragraph headed "Associated with possible signs of riboflavin deficiency" reference is made to cracking at the angles of the mouth and erosion of the buccal mucous membrane which improved with treatment, though at the same time it is stated that no riboflavin was available. It is not clear whether one should infer that the lesions responded to nicotinic acid.] *H. S. S.*

PALLISTER (R. A.). **A Case of Infantile Pellagra in Malaya.**—*Jl. Malaya Branch Brit. Med. Assoc.* 1940. June. Vol. 4. No. 1. pp. 110–113. With 3 figs.

The author calls attention to kwashiorkor described by Cicely WILLIAMS in the Gold Coast [see this *Bulletin*, 1934, Vol. 31, p. 344 ; 1936, Vol. 33, pp. 410, 734] and the condition recorded by H. C. TROWELL in Uganda [*idem.* 1938, Vol. 35, p. 72], and states that he knows of no records of infantile pellagra in Malaya and gives an account as follows : A Chinese infant of 15 months was admitted to hospital at Penang with a history of fever, cough and loose stools for three weeks. It had been breast-fed for 6 months and then on rice (probably polished) and sweetened condensed milk, and a little fruit and fish. On examination the child was anaemic and under-nourished, feet and hands a little oedematous, the skin generally rather dry, and over the

limbs and neck darker than on the face and trunk, and certain areas where desquamation had occurred were pale.

"Over the feet and knees the skin had desquamated but the rest of the legs was pigmented, the dark colour fading as the upper parts of the thighs were reached. On the prominent parts of the back of the iliac crests a similar condition was present and small points of desquamation gave a mottled appearance. The arms were similar but less severely affected; the hands and the backs of the elbows were pale but the rest of the arms was slightly more deeply pigmented than the trunk. Round the back of the neck there was again a mottled appearance from pigmented and desquamated areas. The angles of the mouth and the outer canthus of the left eye were sore. There was a small ulcer at the tip of the tongue. The vulva was red and sore."

There were crepitations, bronchial breathing and some dullness to percussion at the base of the right lung. Treatment with nicotinic acid and vitamin B_1, together with sulphapyridine for the pulmonary condition, proved unavailing and death occurred 12 days after admission to hospital. At autopsy a basal pulmonary abscess was found which had penetrated the diaphragm and become adherent to the liver. *H. H. S.*

PALLISTER (R. A.). **Ataxic Paraplegia occurring amongst Chinese in Malaya.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Aug. 16. Vol. 34. No. 2. pp. 203–211. [13 refs.]

Five years ago the author, in conjunction with J. V. LANDOR, published a paper entitled "Avitaminosis B_2" in which they described a condition, possibly pellagroid, which they observed in Malayan institutions (hence denominated "Prison disease"), characterized by angular stomatitis, superficial glossitis, eczema of scrotum, and, later, nervous symptoms of pain, numbness, weakness of legs, stocking anaesthesia, and in some patients dimness of vision. [See *Bulletin of Hygiene*, 1935, Vol. 10, p. 733.] The condition which is the subject of the present article bears many points of resemblance to the former. The following describes a typical case:—

"The patient is a middle-aged Chinese and he complains of difficulty in walking and numbness of the legs of some months duration. He may, in addition, complain of some trouble with his hands, especially if his work requires skilled movements. On examination he is found to be usually of ordinary nutrition without any distinct wasting of the limbs. The gait is rather unsteady and the feet placed a little apart for greater security. Though he may be able to get along fairly well at his own pace he is quite unable to hurry. The ataxia is not the same as a typical case of tabes dorsalis. The legs are not shot out in such an inco-ordinate manner and the knees are not hyper-extended, but the patient will, like the tabetic, watch carefully the ground in front of his feet. There is no foot-drop and the calves are not tender to pressure. In Rhomberg's position the patient is unsteady. The tendon reflexes are absent in the legs and Babinski's sign is flexor. Sensation is diminished or absent up to the ankles or knees and the position sense in the great toes is lost. In the arms the tendon reflexes may be present or absent and some sensory loss may be found about the hands."

The close affinity to the Jamaican disease, Scott's palsy, will be seen if the full description of the latter is compared [see also this *Bulletin*, 1919, Vol. 13, p. 372]. The absence of diarrhoea at the onset, the peculiar distribution or limitation of the anaesthesia, the variation to tests for touch, pain, kinaesthetic sense are points in common. No

mention is made of reaction to heat and cold; in Scott's cases this was almost the only sense reaction which was generally disturbed. The differences between the "prison disease" previously described and the present "ataxic paraplegia" are, with the exception of tingling and stabbing pains in the legs, very slight and largely matters of degree. Thus, there are numbness and weakness of the legs in both, with "stocking" anaesthesia, but in the former (prison disease) there are tingling and pain and stiffness in addition; the tendon reflexes are usually brisk but may be absent in the former, sometimes present, but usually absent in the latter; unsteady gait and Rombergism [not Rhombergism; the sign is named after Moritz Heinrich Romberg of Berlin] are present in both; the diet in those suffering from the former was parboiled rice with moderate subsidiary diet, in the latter polished rice and poor subsidiary diet. The author concludes after a very fair discussion that the condition he describes is probably pellagra "modified by other factors in the diet or circumstances of those affected." [The article should be read in the original; an abstract cannot do its merits full justice.] *H. H. S.*

URABE (Kiyosi). Studien ueber Pellagra in Chosen (Korea). II. Mitteilung: Klinische und statistische Beobachtungen ueber Pellagra im Jahre 1939. [Abstract.] **[Pellagra in Chosen (Korea) in 1939: Clinical Observations.]**—*Japanese Jl. Dermat. & Urol.* 1940. Jan. 20. Vol. 47. No. 1. pp. 2–3.

Pellagra is more frequent in Chosen than in Japan, it is stated. The author observed 38 cases in the first half of 1939; females were more numerous than males [numbers unstated], and most were between 20 and 35 years of age. The rash was seen on the backs of the hands, dorsa of feet, the neck, chest, abdomen, genitalia and face. A few presented the "pellagra mask" and Casal's necklace. Eight had a pellagra tongue and in the majority gastro-intestinal disturbances were present. Ten suffered from obstinate peripheral neuritis, eight had Romberg's sign and one a definite pellagra psychosis. Blood changes were present in all; in mild cases the haemoglobin (Sahli) was reduced to 70 per cent. and in severe cases to 20 per cent. or less. The ascorbic acid content of the urine was usually below normal to 0·98 mgm. per cent. *H. H. S.*

VAN BOGAERT (L.) & VAN DEN BERGHE. Sur un cas de pellagre autochtone. **[A Case of Pellagra in Belgium.]**—*Bull. Acad. Roy. de Méd. Belgique.* 1939. 6th Ser. Vol. 4. No. 9. pp. 409–418.

Very few cases of pellagra have been reported from Belgium but, as the author points out, many probably pass unrecognized.

The case is then described of a 54 years old woman received into the hospital at Antwerp with a six months history of symptoms progressively increasing in severity—painful paraesthesia of fingers, spreading to the hands and forearms, lancinating pains in all the limbs, pain in the tongue and scalp. There was difficulty in performing finer movements and walking was much impaired. The woman was depressed and miserable and spent her days hiding from the light, refusing to wash and eat. The memory was faulty and her story was in many parts untrue. There was some yellowish pigmentation of the skin of the face and the skin of the back and abdomen was scaly and of a dirty brown colour. The backs of the hands were also brown

and the seat of marked keratosis; the palms of the hands, dorsa of the feet and ankles also showed hyperkeratosis. The tongue, lips and gums were red and had a varnished appearance. Further examination revealed all forms of sensation in the skin, together with vibration sense, to be affected: there was marked hypochlorhydria, anaemia and leucopenia: gastroscopy was negative, the mucous membrane may have been a little pale and atrophic. Marrow obtained by sternal trephine showed no abnormal cells though the myelogram showed variations from the normal. The case was thought to be one of myxoedema fruste and the diagnosis of pellagra made on the scaly pigmented skin, neuritic symptoms, psychic disturbance, hypochondriacal state, etc.

There was no history of deficiency in the diet nor of diarrhoea associated with organic disease.

[The report is a rather disappointing one as so much is left unsaid, and treatment including the use of nicotinic acid was left untried, but the case is given at some length as it is one of those that may easily be missed.] *H. S. S.*

CAMPBELL (S. B. Boyd) & ALLISON (R. S.). **Pellagra, Polyneuritis, and Beriberi Heart.**—*Lancet.* 1940. Apr. 20. pp. 738–739. With 5 figs.

Of the two cases described one is that of a fairly typical pellagrin, the other with a mingling of the symptoms of pellagra and beriberi. The first patient was a man of 31 years who stated that ten days before coming into hospital he noticed that the backs of his hands were swollen and of a dark brown colour, and his face and neck became similarly pigmented. Five days later his legs swelled; he had difficulty in walking, and when admitted could scarcely raise his legs from the bed. Sensory symptoms were slight, no numbness, no pain in muscles. The legs were oedematous and patellar reflex sluggish. Wassermann reaction was negative. He was given Bemax by mouth and vitamin B_1 by injection. Improvement was rapid; the oedema disappeared and leg movements were almost normal six days after admission. The back of the hands, the face and neck desquamated.

The second patient was a woman of 56 years, who stated that her legs became "red and itchy"; next day a rash appeared on the extensor surfaces of arms and legs and later the backs of the hands, the face and the neck became dull red, later brown. She had diarrhoea for five weeks with wasting, but no oedema. Treatment with Bemax and nicotinic acid resulted in a gain of 11 lb. in 4 weeks and disappearance of the rash. In this patient there was certainly deficient intake of vitamin B_2, possibly aggravated by the diarrhoea and achlorhydria. In the first there was no deficiency of intake, the food was adequate, but there may have been some unrecognized cause interfering with absorption, leading to signs of deficiency of two types. *H. H. S.*

RAMAN (T. K.). **Pellagra in India. A Study of Twenty-Five Cases in Vizagapatam.**—*Indian Jl. Med. Res.* 1940. Jan. Vol. 27. No. 3. pp. 743–756. With 12 figs. on 3 plates. [25 refs.]

The author finds for his hospital at Vizagapatam [on the coast of the N. E. corner of Madras] that pellagra accounts for 0·65 per cent. of admissions to the medical wards. Ten cases were admitted in 1937,

eleven in 1938, twenty-one in 1939. Of these, 25 form the basis of his article and case notes are given of 6 patients. The subjects belonged to a county where rice is the main article of diet. Pellagra was found in persons suffering from tuberculous peritonitis, beriberi, leprosy, carcinoma of the penis, stricture of the urethra, hemiplegia or diabetes or who had undergone operation for duodenal ulcer; in some cases the disease may have been an aetiological factor. The paper is a long one and accompanied by some excellent photographs. Among the findings recorded are the following: the anaemia present may be of macrocytic, normocytic, or microcytic type: gastric acidity is commonly low with absence of free acid but there may be an hyperchlorhydria: blood protein, especially albumin, is low and cholesterol values decreased, these become normal with treatment: there is an increase in total fats in the stool, with a relative increase of both neutral and split fats.

The paper makes an interesting contribution concerning pellagra in India. *H. S. S.*

GOODALL (J. W. D.). **Observations on the Use of Nicotinic Acid in the Treatment of Pellagra and Allied Conditions.**—*Indian Med. Gaz.* 1940. Mar. Vol. 75. No. 3. pp. 147–153. With 3 figs.

Writing from the Presidency General Hospital, Madras, Captain Goodall says that "In India cases of pellagra are frequently met with." He then goes on to describe some twenty patients, treated with nicotinic acid, whom he divides into three groups: (*a*) Those with true or classical pellagra—3; (*b*) cases of "nicotinic acid deficiency"—12; (*c*) miscellaneous—5, pointing out at the same time that the difference between (*a*) and (*b*) is only a question of degree.

Group (*a*) included 1 Hindu agriculturist and 2 unemployed Anglo-Indians; all responded satisfactorily to nicotinic acid therapy. Of those in group (*b*), all persons belonging to the poorer classes subsisting on rice and dâl, 5 showed a glossitis, 7 had gastro-intestinal symptoms, in 11 there was "some change" in the skin, attributed by the patients to the cold weather, in 7 the patellar reflex was increased. Two subjects also showed signs of beriberi. All were mentally dull and apathetic, in all there was discovered a hypochlorhydria and a hypochromic anaemia. All this group improved under treatment with nicotinic acid. In group (*c*) were included five cases of secondarily infected scabies of hands, feet, etc., commonly associated with mental apathy. The administration of nicotinic acid resulted in the most striking and rapid peeling off of all the crusted lesions. Several photographs are reproduced but unfortunately they show very little.

H. S. S.

BARLOVATZ (A.). Glossite marginale et stomatite angulaire. [**Marginal Glossitis and Angular Stomatitis.**]—*Ann. Soc. Belge de Méd. Trop.* 1940. Mar. 31. Vol. 20. No. 1. pp. 13–22.

Many cases of glossitis and angular stomatitis are seen among miners in the Lower Congo. The incidence is much higher (five times or more) among men than women. Of 1,356 men and 463 women examined the percentages affected were: Desquamating or exfoliating glossitis 5·9 and 0·8; erosions at the angles of the lips

3·5 and 0·3, both these present in 6·2 and 1·2 per cent. The men were working at posts some distance apart and the numbers affected varied greatly. At one post, only four were found among 156, or 2·6 per cent.; at another 151 out of 336, or 42 per cent. In this last were but a few cases of beriberi; these were more numerous at other posts. Nicotinic acid has been found to bring about speedy amelioration to stomatitis and glossitis patients, but the author found vitamin B_1 very useful. The condition has been ascribed to the quantity of fish, dried or salted, consumed, and in places where groundnuts and bananas were eaten also these cases were not observed. In the author's hands the giving of vitamin B_1 has yielded the best results and the signs are very much like those seen in Wright's vitamin A and B deficiency [see this *Bulletin*, 1936, Vol. 33, p. 887; also *Bull. of Hyg.*, 1929, Vol. 4, p. 391].

H. H. S.

ELVEHJEM (C. A.). **Relation of Nicotinic Acid to Pellagra.**—*Physiological Reviews.* 1940. Apr. Vol. 20. No. 2. pp. 249–271. [126 refs.]

LAVARELLO (Aldo O.). El ácido nicotínico, su acción y su importancia en clínica. [**Nicotinic Acid. Its Action and Importance in Clinical Medicine.**]—*Prensa Méd. Argentina.* 1940. Apr. 10. Vol. 27. No. 15. pp. 786–800. With 2 figs. [17 refs.]

LEWY (F. H.), SPIES (T. D.) & ARING (C. D.). **The Incidence of Neuropathy in Pellagra. The Effect of Cocarboxylase upon its Neurologic Signs.**—*Amer. Jl. Med. Sci.* 1940. June. Vol. 199. No. 6. pp. 840–849. With 1 chart. [14 refs.]

Previously it had been demonstrated that the skin lesions and some of the neurasthenic symptoms of pellagra cleared up under treatment with nicotinic acid amide, while others were uninfluenced, such as pain in the calves, numbness of the extremities, weakness, difficulty in walking, dizziness, lassitude, fatigue, increased sensitivity to light and noise, loss of memory, insomnia, irritability—though many of these symptoms were relieved by the administration of thiamin. Further, some patients thus relieved developed symptoms of riboflavin deficiency.

In the present article the authors give their results with cocarboxylase (the phosphorulated ester of thiamin) in 50 white pellagrins classed as: mild 16, moderately severe 23, severe 10, and 1 very bad case; all of whom exhibited some neuropathic symptoms. Among those of the first two groups three-quarters of the cases showed abnormal electric excitability of motor nerves and tenderness of nerve trunks, one-third decrease of pain sensibility and pupillary reflex, with ataxia; in a fifth the corneal reflex was diminished, muscle power lessened, sensibility to touch lowered, nystagmus and deviation of the tongue were noted, together with Romberg's sign, pyramidal signs, and mild Parkinsonism. A single intravenous injection of cocarboxylase was followed in a short time by rapid improvement; under-excitable nerve-muscle apparatus was restored to normal in 1 to 4 hours. In some cases symptoms persisted showing that the pathological process had reached an irreversible stage. It is shown, therefore, that cocarboxylase has a similar action to thiamin. *H. S. S.*

SMITH (Susan Gower) & MARTIN (David W.). **Cheilosis successfully treated with Synthetic Vitamin B_6.**—*Proc. Soc. Experim. Biol. & Med.* 1940. Apr. Vol. 43. No. 4. pp. 660–663. With 1 fig. [10 refs.]

Four cases are reported. The first, a girl with pellagra and severe anaemia, was treated with synthetic vitamin B_6 hydrochloride. After a few doses of 20 to 40 mgm. intravenously the cheilosis healed completely and the anaemia responded although the diet on which the patient was maintained (low in the B complex and especially low in riboflavin) contained little iron. The second patient received larger doses intravenously and by the mouth and the cheilosis was entirely healed on the fifth day, but anorexia, anaemia and severe weakness were unaffected. In the third case the cheilosis developed while the patient, suffering from coeliac disease, was on a diet of milk and bananas. The mouth lesions healed completely on treatment with vitamin B_6 hydrochloride. The fourth patient was suffering from sprue and was extremely deficient in many of the vitamin factors. Slight improvement followed the administration of B_6 but complete healing did not occur even when riboflavin and nicotinic acid were added. The addition of concentrated liver extract given intramuscularly, however, brought about cure. Two other patients are recorded in a footnote, one responded to B_6, the other to riboflavin.

There are three possible explanations of the fact that both riboflavin and B_6 cure cheilosis :—(1) That deficiency of riboflavin is primary, and deficiency of B_6 acts only indirectly ; (2) The reverse ; (3) That both factors are necessary to maintain healthy lips and that a deficiency of either will precipitate the lesion. *C. W.*

GOLDSMITH (Grace A.), OGAARD (Adolph T.) & GOWE (Donald F.). **Vitamin C Nutrition in Pellagra.**—*Amer. Jl. Med. Sci.* 1940. Aug. Vol. 200. No. 2. pp. 244–249. With 1 chart.

The diet of patients who develop pellagra is often low in ascorbic acid ; it seems likely that ascorbic acid values would be low in these patients. Eighteen patients with pellagra were tested. The symptoms were severe in 12, mild in 5, while 1 showed only glossitis associated with severe proctitis and vaginitis. The method of investigation was as follows :—

" The intravenous tolerance test was carried out as follows : The level of ascorbic acid in the plasma was determined before the intravenous administration of 1 gm. of crystalline ascorbic acid, and at 20 minutes, 2, 4, and 6 hours following this administration. The urinary excretion in the subsequent 5 hours was likewise measured as suggested by Wright. The oral tolerance test was performed as described by Goldsmith and Ellinger : 600 mg. of ascorbic acid were given by mouth, the amount excreted in the urine in the subsequent 6 hours measured, and the level in the blood determined at the end of 1 and of 3 hours. The ascorbic acid in the blood was determined by the method of Farmer and Abt, that in the urine by titration with 2-6-dichlorphenol-indophenol after acidification with glacial acetic acid."

In 8 of 14 pellagrins tested an ascorbic acid deficiency was found ; 4 additional cases showed less than the normal amount of ascorbic acid in the blood during fasting. Three persons who had recovered from

pellagra some 3–6 months before still complained, one of weakness, anorexia and loss of weight, a second of vague gastro-intestinal symptoms and a third of purpuric areas in the skin. All were found to have a vitamin C deficiency and all showed rapid clinical improvement on appropriate diet and ascorbic acid 200 to 300 mgm. daily.

H. S. S.

LEONIDA (Josif). Ueber die hormonale Therapie der Pellagra. [**Hormone Therapy in Pellagra.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1939. Oct. Vol. 43. No. 10. pp. 440–451.

MISCELLANEOUS.

SCOTT (H. Harold). **Treatment of Tropical Disease.**—*Britain To-day.* 1940. July 26. No. 32. pp. 4–8. With 5 figs. on 2 plates.

This is a short paper, written for the lay reader, in which the author has given an outline of the difficulties encountered by those responsible for improving or maintaining the health of the indigenous populations of tropical countries, and of the methods employed to cope with the problems raised. In view of the ignorance of the true causes of disease displayed by native peoples it is essential to gain their confidence in the value of modern medical procedures, and to this end curative medicine must first be stressed by the institution of hospitals and dispensaries for the treatment of existing ailments. The provision of sound sanitation and the principles of preventive medicine are next insisted upon, with the object of avoiding those major diseases which are so ruinous in tropical countries. These measures, of course, are largely concerned with the eradication of insect vectors of disease.

Deficiencies in diet are common in these countries, and to correct them, closely combined action by the medical, agricultural and veterinary departments is necessary. Health education of the populace is provided at schools and by mobile Health Units, and in many places medical schools have been founded at which selected natives are given instruction which qualifies them to perform the duties of subordinate medical officers in their own countries. This is a necessary provision since the European medical staffs cannot themselves cope with the large population concerned. Dispensers, dressers and nurses are also trained locally in large numbers.

The author concludes with remarks on the encouragement given to research workers by the Colonial Office and by certain scientific bodies, and adds a few paragraphs in homage to British workers, from Manson onwards, who have done so much to advance the knowledge of tropical disease.

The article is a clear and authoritative statement of those first principles which guide British medical policy in the Colonies, and may be read with advantage by medical men interested in that policy.

C. W.

FIELD (J. W.). **A Simple Method of preserving the Outlines of Leucocytes and Malarial Parasites in Giemsa-stained Thick Blood Films.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Apr. 30. Vol. 33. No. 6. pp. 635–638. With 8 figs. on 1 plate.

It is usually recommended that thick blood films should be dried for several hours before staining in order to avoid distortion of the leucocytes and parasites and this tends to limit the usefulness of this method in the diagnosis of malaria. A chance observation that the cytoplasm of leucocytes and blood protozoa is protected from the damaging effects of lysis by a brief preliminary treatment with a basic stain led to the adoption of the procedure described, which is successful with thick films as soon as the blood ceases to be obviously moist. The preparation of the solution and the procedure are as follows :—

" Methylene blue, 0·5 gramme.
" Disodium hydrogen phosphate (Na_2 HPO_4 $12H_2O$), 3·7 grammes.*
" Monopotassium dihydrogen phosphate (KH_2 PO_4), 0·5 grammes.
" Distilled water, 100 cc.

" (*a*) Dip the films for 1 second into a jar containing the methylene blue solution.

" (*b*) Wash for a few seconds by waving *very gently* in a vessel containing clean tap water.

" (*c*) Place the films in a staining trough, add diluted Giemsa stain and allow them to remain in the stain for from half to 2 hours, according to the concentration of stain.

" (*d*) Float off the scum by allowing a little tap water to trickle into the staining trough.

" (*e*) Remove the films from the trough and place vertically to dry."

The methylene blue solution is isotonic and buffered to *p*H 7·2. Dispersion of cytoplasm is largely prevented and the outlines of the parasites are well retained. Giemsa diluted 1 drop to 4 cc., and used for 1–2 hours' staining gives a cleaner background than stronger solutions. *C. W.*

GAVRILOV (W.) & NIJS (J.). Appareil à dessication à températures ordinaires et basses. [**An Apparatus for Desiccation at Normal or Low Temperatures.**]—*Ann. Soc. Belge de Méd. Trop.* 1939. Dec. 31. Vol. 19. No. 4. pp. 527–531. With 1 plate.

The apparatus consists of :—

1. An electric vacuum pump, or a water exhaust provided that the pressure can be lowered by almost 760 mm. Hg. This communicates by a vacuum tube provided with a two-way tap with

2. The condenser, a pyrex flask of 750 cc. half filled with anhydrous calcium chloride and placed in a Dewar bell.

3. A horizontal glass tube closed at its end and provided with taps, and connected with a mercury vacuum meter and with the condenser. To the taps are fitted the tubes containing the material to be dried.

Solid CO_2 is placed in the Dewar bell around the condenser, and the temperature falls to about −80°C., and the tubes containing the material to be dried are similarly cooled with solid CO_2 and methyl alcohol. In the tropics where solid CO_2 is not available it may be prepared from liquid CO_2 by apparatus designed for the purpose.

*If the anhydrous salt is used the amount of disodium hydrogen phosphate should be 1·48 grammes.

The pump is then set going. Under these conditions tissue cut into small pieces and the size of the index finger is dried in 4 to 6 hours and needs 2½ to 3 kgm. of solid CO_2.

Virus of herpetic encephalitis desiccated in this manner retains its virulence in full for one to two months, and the method may be suitable to work with the viruses of tropical diseases. *C. W.*

McKenzie (A.). **Nutritional Diarrhoea : a Critical Examination.**—*East African Med. Jl.* 1940. Apr. Vol. 17. No. 1. pp. 30–45. [15 refs.]

The condition is described as "a severe form of afebrile diarrhoea unrelated to infection with micro-organisms, helminths or protozoa, accompanied by wasting and frequently terminating in death." Of 320 cases seen during the last 4 years in the Morogoro hospital (Tanganyika Territory), 142 have died. The disease in this district occurs almost exclusively in labourers on sisal plantations, who live in compounds. The standard ration was :—maize meal 24 oz. daily, beans 6 oz. daily, ground nuts 4 oz. twice weekly, fish or meat 4 oz. twice weekly. There was little opportunity of buying additional food of good nutritional quality, and the rations were issued uncooked. Rations were not issued for days on which work was not done and as it was estimated that 30 days' work was completed only in an average of 45 to 55 days, it is evident that the full daily calory value of 3,000 was rarely attained. The diet was therefore quantitatively inadequate, it seriously lacked animal protein, vitamins A and C, and the cooking was generally inadequate since it was done hurriedly and fuel was not easy to obtain.

The disease is afebrile. It commences after a period of work of about 6 months or more ; there are 4 to 10 watery stools a day, containing undigested débris but no mucus and no blood. The patient is emaciated, with low blood pressure and feeble circulation, and follicular keratosis is common. Angular stomatitis and glossitis of the pellagra type were not seen. The best form of treatment was found to be a small saline purge followed by large and frequent doses of kaolin, and rectal enemata of cod liver oil were valuable ; saline and glucose may be given by enema or by injection. This treatment was combined with a standard diet consisting of a dish of well boiled rice to which was added red palm oil, minced liver slightly scalded, and fresh grated pawpaw. Massive doses of vitamin A, nicotinic acid and liver extracts gave little result, and vitamins B and C produced no effect. When the critical phase was past, attention was paid to hookworm or other conditions present. It is pointed out that unless gain in weight takes place, cure is not established and relapse, sometimes fatal, may follow. To return cured patients to work under conditions which brought on the disease is to court relapse.

The pathological appearances of the intestine were largely those of degeneration of epithelium with numerous haemorrhages which may indicate deficiency in vitamin C. Pathogenic organisms were rarely found in faeces plated out.

In discussion of these findings McKenzie points out that during the past 18 months the incidence has fallen remarkably, largely owing to improved dietetic conditions in the plantations and to better medical care there ; an issue of red palm oil is now instituted on most estates. He refers to pellagra and concludes that nutritional diarrhoea

does not show the classical signs of that disease. Apart from the quantitative lack of food and the impossibility of tracing the origin to the absence of any single dietetic factor, however, it is possible that the condition may be the result of the lack of a combination of factors and that it is precipitated by undernourishment added to previously existing malnourishment. [This record of careful work should prove of the greatest value for those who are in medical charge of, or who legislate for, plantation labourers.] *C. W.*

ROBERTSON (R. Cecil). **The Problem of Endemic Goitre in Yunnan Province.**—Reprinted from *China Jl.* 1940. Jan. Vol. 32. No. 1. pp. 26–36. With 1 map in text & 17 figs. on 8 plates.

The incidence of goitre among the inhabitants of Yunnan Province is high, and some show symptoms of cretinism. Investigation has shown that iodine is deficient not only in the salt but also in the vegetation. Now that the Japanese are occupying the hinterland of China the latter is deprived of its coastal salt supply, and is obtaining salt from the Yunnan mines; hence if hostilities are prolonged the iodine deficiency will become more acute. An advisory committee, the Yunnan Anti-Goitre Association, has been formed to study the question, to plan and promote anti-goitre measures, to arrange surveys periodically, and maintain a liaison with anti-goitre work elsewhere.

In some parts of the Province the incidence is as high as 80 per cent., and a large proportion is of the parenchymatous variety. The patchy distribution of the goitre districts in Western Yunnan and the Shan States is thought to be connected with the geological formation. Iodine will doubtless benefit some, and more particularly the slighter cases, but others would need surgical intervention. Several instances have been noted of students coming into the district from coastal provinces where goitre is not endemic and developing the condition; a residence of six months seems to be sufficient in a susceptible subject. The article is illustrated by well-reproduced photographs.

H. H. S.

CASTELLANI (Aldo). **Brief Notes on Some Little-Known Fevers.**—*Jl. Trop. Med. & Hyg.* 1940. Feb. 1. Vol. 43. No. 3. pp. 33–37. With 2 charts. [14 refs.]

Tropical low fever is insidious in onset with intermittent fever rising at midday to a limit of 102°F. Eosinophilia may be present, the course may be long, no signs of the usual causes of fever may be found and anti-malarial drugs are ineffective. Recovery quickly follows a change from a hot to a temperate climate. Points in differential diagnosis from 17 forms of low fever of known origin are given.

The author describes a non-malarial quartan fever and a quartan fever of luetic origin, of which he has seen only one case. Plurindiem fever, in which the temperature may rise twice or thrice during the day, is referred to; again the aetiology is unknown and drug treatment unavailing, but the condition responds to transfer to a cool climate. Intermittent urticarial fever is characterized by quotidian, tertian or quartan fever with attacks of urticaria and occasional joint swellings; the causation is unknown but it is probably of an allergic nature, it must be differentiated from similar conditions seen in infections with

Schistosoma japonicum, Ascaris or Taenia. A high intermittent non-malarial fever is seen in children in Ceylon; here again change of climate stops the condition almost at once. Garden fever is a short summer fever seen in S. Europe and in Africa. In most instances it develops after an afternoon's gardening and may be due to the bite of some insect. In some cases there is a high platelet count. The fever lasts from 3 to 6 days and may be of the saddle-back type.

Double continued fever begins insidiously; the temperature rising to 104°F. and remitting about 3° daily, with slow pulse, moist red tongue and constipation. After 10 to 15 days lysis occurs and the temperature is normal for 2 to 7 days, thereafter rising to a second paroxysm similar to the first and lasting about 10 days. Anaemia is present and convalescence slow; it has been suggested that in reality the cases seen have been enteric or undulant fever.

Summer fever of the Gulf Stream is another condition attributed to climatic influences.

The author discusses the hypothesis of DE LANGEN and SCHUT that in the tropics the sugar content of the blood is higher than in Europe owing to stimulation of the suprarenals by heat and humidity. The burning up of the sugar may raise the body temperature. Due consideration is paid to the elimination of other disease, including tuberculosis, in the diagnosis of these fevers. [The premenstrual rise of temperature which has been noted in England may be exaggerated in the tropics and may cause considerable disquiet if not borne in mind.] *C. W.*

LASSMAN (P.). La réaction de sédimentation chez les noirs du Congo belge. [**The Blood Sedimentation Rate of the Natives of the Congo.**] —*Ann. Soc. Belge de Méd. Trop.* 1939. Dec. 31. Vol. 19. No. 4. pp. 557–560.

The author tested the blood sedimentation rate of 1,258 healthy labourers by the method of Westergren, reading the results after one hour. In Europe a fall of 20 mm. in this period is regarded as the limit of the normal, but in these natives a fall of 20–30 mm. occurred in 541, of 30–40 mm. in 245 and of more than 40 mm. in 143. The physical condition and the medical history of these men, often available over several years, confirmed the fact that they were in excellent health, and the author therefore gives a warning that since readings usually regarded as absolutely pathognomonic are frequently seen in the healthy natives, care should be taken in drawing conclusions from this test in isolated cases. In a series of cases of pulmonary tuberculosis the readings were high (all were over 30 mm.), in cachexia due to different causes they were also in general rather high, but in tropical ulcer great variations were found. *C. W.*

OLMES DE CARRASCO (Hede). Einige neuere Gesichtspunkte für die Behandlung des Maltafiebers. [**Fresh Viewpoints in the Treatment of Undulant Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1939. Nov. Vol. 43. No. 11. pp. 500–513. [25 refs.]

Twelve cases are recorded with detailed blood and other examinations. Four were treated with prontosil rubrum in 0·5 gm. tablets

by mouth, two by prontosil soluble, 5 cc. ampoules of 5 per cent. solution, and six by a combination of these forms of treatment. In this last, in 10–20 days a total of 25 gm. prontosil was given, and for 16–30 days injections totalling 4–7·5 gm., and for 6–12 weeks during which the prontosil was pushed for 8–16 days, up to 4 gm. daily in place of 1·5–2 gm. In the 6–12 weeks some 4 gm. were given by injection and 104 gm. *per os.*

In the intervals other forms of treatment, *e.g.*, protein shock and milk injections, were employed. All twelve patients made a good recovery and no untoward symptoms resulted from the larger doses. The author seemed to think that the peroral administration was more effectual than the parenteral and that in future the former should be tried first and more persistently before resorting to injections. [See also this *Bulletin*, 1938, Vol. 35, p. 826 ; 1939, Vol. 36, pp. 157, 942.]

H. H. S.

HAMBURGER (H. J.). **Observations on the Pathology and Therapy of the So-called Frontier Sore. (Second Communication.)**—*Indian Med. Gaz.* 1940. Feb. Vol. 75. No. 2. pp. 76–78.

In 58 patients (of a detachment of 80 men) who contracted frontier sore during one year at Tonk all stated that the sore took its origin from an insect bite. The sores are usually on the extremities and usually show infiltration and hardness with discharge or scab. The duration of the disease under ordinary treatment is about 4¼ months. In the aetiology no evidence of food deficiency could be found and it was noted that in a detachment of men at Bannu near Tonk only one case occurred in the following hot season. In no case were Leishmania found, though a search was made. Of 6 examined bacteriologically 3 were sterile, the material having been taken from " closed " ulcers, and from the others spore-bearing organisms of the *subtilis* group, *Staphylococcus aureus* and diphtheroids were isolated. These were thought to be secondary invaders and the author considers the cause of the disease, which is a clinical entity, to be a non-bacterial agent transmitted by insects.

Treatment with 5 per cent. ointment of prontosil rubrum or prontosil base was strikingly effective and economical and of 20 patients 19 were cured by 6 to 8 applications given daily or on alternate days. There appeared to be no benefit in simultaneous oral administration of prontosil. [See also this *Bulletin*, 1940, Vol. 37, p. 223.] *C. W.*

EARLE (K. Vigors). **Sulphanilamide in the Therapy of Tropical Ulcer.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. June 27. Vol. 34, No. 1. pp. 105–108. [11 refs.]

The drugs used (M. and B. 693 and Prontylin) were administered by the mouth, and local treatment of the ulcers either with applications designed to clean dirty ulcers (magnesium sulphate and glycerin ; copper sulphate) or with those which promote epithelialization (cod liver oil ; whale oil ; scarlet red sulphonate) was given. In chronic ulcers the results were not good, only 2 of 8 healing within 3 weeks. In recent ulcers 14 of 38 healed within 3 weeks. In pre-ulcerative conditions (minute vesicles, seen only in 12 Europeans in this series) all were arrested and ulceration did not occur. *C. W.*

DEY (A. C.). **Topical Application of Sulphanilamides.**—*Indian Med. Gaz.* 1940. Mar. Vol. 75. No. 3. pp. 161–162.

The author used urea sulphazide, a sulphanilamide compound, as a local application in 2½ or 5 per cent. solution, or 5 per cent. ointment, in the treatment of boils, carbuncles, cellulitis and similar lesions, after incision, For deep seated pockets preliminary irrigation with normal saline was employed and gauze soaked in the solution was applied. Dressings were changed daily and 8–10 dressings were needed in the cases quoted. In the final stages the ointment was used. The results were good and though the series is small, they indicate that the method should be further tried. The drug is non-irritating, quickly controls the purulent discharge and is inexpensive. *C. W.*

RIOU (M.). La sulfamidothérapie externe en dermatologie et en chirurgie. [**External Sulphonamide Therapy in Dermatology and Surgery.**]—*Rev. Méd. Française d'Extrême-Orient.* 1939. Dec. No. 10. pp. 1091–1103. With 4 figs. on 1 plate.

The preparations employed are diluted or mixed with various substances and used in the form of powder, lotion or paste. The formula of the latter is as follows :—Powdered M. and B. 693, 8–10 gm., menthol 0·2 gm., sapolan 10·0 gm., zinc oxide and calcium carbonate, each 15 gm., cod liver oil and lanolin, each 25 gm. The important feature of this formula is the association of the drug with a vitamin. For use in cases of phagedaenic ulcer this paste is applied on Cellophane, which is held in place on 3 sides with adhesive plaster, the fourth side being left free for the escape of discharges. In this way 23 ulcers were cured by daily applications, in relatively short periods, even though other methods of treatment had failed over periods of months. Photographs of one acute and one chronic ulcer, cured respectively in 27 and 34 days, are reproduced.

The paste has been used with success in streptococcal impetigo, pemphigus contagiosus, intertrigo and a number of other skin diseases due to bacterial infection, including phagedaenic ulcers of the genital regions. *C. W.*

CONNELL (W. K.). **Treatment of Wounds with "Zipp."** [Correspondence.]—*Brit. Med. Jl.* 1940. Feb. 17. p. 273.

In 1931 the author and Dr. J. C. R. BUCHANAN devised, on the analogy of BIPP, a dressing of creamy consistency in which zinc oxide took the place of bismuth, which they named Zipp, composed of zinc oxide 1 part, iodoform 2 parts, liquid paraffin 2–3 parts, ground in a mortar. They have used it with much success in the treatment of chronic ulcers, which are the cause of a vast amount of disablement in nearly all tropical countries. It has taken the place of the petroleum jelly formerly used, because the odour evolved from the latter dressing became overpoweringly foul and the preparation in some patients set up a severe ulcerative dermatitis [see this *Bulletin*, 1934, Vol. 31, p. 337]. It is useful also in treatment of compound fractures; the authors have not seen many of these in their tropical experience, but stress its value in tropical ulcers. *H. H. S.*

CALDWELL, A. F. **Hydrogenated Fats in the Preparation of Ointment Bases for Tropical Countries.**—*Quarterly Jl. Pharm. & Pharmacol.* 1939. Oct.–Dec. Vol. 12. No. 4. pp. 689–698.

"1. Hydrogenated palm kernel oil, melting-point 40° to 42°C., is a suitable fat to replace lard and suet in ointments in tropical countries.

"2. By altering the degree of hydrogenation the melting-point of the hydrogenated fat can be altered.

"3. It shows little tendency to become rancid.

"4. A mixture of hydrogenated palm kernel oil with 12·5 per cent. of soft paraffin forms a suitable ointment base for use in Malaya, where absorption or penetration of the ointment is required.

CALDWELL, A. F. **Suppository Bases for Use in Tropical Countries.**—*Quarterly Jl. Pharm. & Pharmacol.* 1939. Oct.–Dec. Vol. 12. No. 4. pp. 680–688.

"1. The addition to cocoa butter of substances which are soluble in fats rapidly lowers the melting-point and also lowers the transition temperature.

"2. The use of hardening agents such as beeswax is not recommended as the transition temperature becomes too close to the temperature at which the mixture softens sufficiently to mould suppositories. In temperate climates hardening agents may be satisfactory but for the extemporaneous dispensing of suppositories in the tropics they are useless.

"3. With proper manipulation and correct control of temperature, using a thermometer suppositories can be made in tropical countries with cocoa butter provided they do not contain medicaments which lower the melting-point to such an extent that they remain soft at room temperature.

"4. It is recommended that the monographs of the British Pharmacopœia and British Pharmaceutical Codex be modified, as they are of no assistance in the present form to dispensers in the warmer parts of the British Empire.

"5. The statement that the base should melt at 37°C. means very little unless the method of taking the melting-point is given. It is recommended that a base should be just pourable at temperatures not above 40°C.

"6. Hydrogenated palm kernel oil having the physical and chemical characters shown in the previous report is suitable for use as a suppository base in warm climates. In cases where the base is too soft owing to a high temperature or where the melting-point is lowered by soluble medicaments it may be hardened by the addition of hydrogenated soya bean oil, melting-point 58°C., or beeswax. For general use in Malaya in suppositories containing no soluble medicament the addition of 5 per cent. of hardened soya bean oil is satisfactory but if fat-soluble substances are present the amount of hardening agent must be increased.

"7. There is little change to a metastable state when the palm kernel oil is heated to temperatures well above the softening-point and the lowering of the melting-point due to this change is too small to be of any practical significance.

"8. The cost of hardened palm kernel oil compares favourably with that of cocoa butter."

SEYBERLICH & LÊ-THI-VAN. Action véritablement merveilleuse d'un pansement annamite à base de plantes. **Surprising Effect of an Annamite Dressing made from Plants.**—*Rev. Méd. Française d'Extrême-Orient.* 1939. Dec. No. 10. pp. 1129–1131. With 1 plate.

The authors record the case of a man of 34 years with two large suppurating buboes, each larger than the palm, indolent and very

resistant to treatment. He had hot antiseptic applications, bismuth, iodoform, antidiphtheria serum, scraping, partial excision, protein shock, antihaemotherapy, vitamin A, etc., but without any lasting benefit, any attempted healing rapidly breaking down again. (The W.R. was negative.) After 5 months his general state was poor and the local lesions showed no signs of healing and the patient left hospital at his own request. Six weeks later he presented himself and, though still weak, he was sweater and the wounds were firmly cicatrized. He stated frankly that he had placed himself in the hands of a Sino-Annamese woman who applied a "plant plaster" twice a day to the site and in a month the place had healed completely.

The authors interviewed the woman who told them without reserve that she used the leaves of three plants growing in the woods of Huyèn, Tung-Thiên, and these were identified by Professor Perrot, of the University of Hanoi, as *Ipomoeba luncifolia* Swartz and guava. The last is fairly common, but the others, belonging to the Families Rutaceae and Liliaceae respectively, are rarer. These were planted in the gardens of the Son-Tây Hospital but the conditions of growth were evidently not suitable for they died small and stunted.

The method of employment is as follows: The leaves are cut up finely and wrapped in a piece of banana leaf; this is folded over, fixed with a needle of bamboo and applied to the wound. The dressing is renewed twice a day [applied twice a day]. That the healing was not mere coincidence is probable because, state the authors, they have since treated in this way six other patients with indolent wounds and in every case a rapid cure has resulted. The leaves are deported. *H. H. S.*

Benson (Robert L.). **Diagnosis of Hypersensitiveness to the Bee and to the Mosquito with Report on Successful Specific Treatment.**—*Arch. Intern. Med.* 1939. Dec. Vol. 64. No. 6. pp. 1306–1327. With 4 figs. [31 refs.]

The author gives an account of cases of extreme sensitiveness to the stings of bees and the bites of mosquitoes. In these there is an immediate weal of considerable size, followed by extensive inflammatory infiltration reaching its maximum in 24 to 48 hours and lasting for several days. These effects are due to antigens, distinct from venom, which can be obtained in extracts of the bodies of the insects. They are specific in regard to the genus rather than to the species.

Desensitization can be effected by intracutaneous inoculation of extracted antigen, preferably prepaphared from dried extracts of the insects with cold alcohol or saturated solution of ammonium sulphate and later dissolved [prepared antigen can be obtained from the Lederle Laboratories]. These antigens give rise to both the early weal and the later inflammation, and courses of inoculations, or in some cases even a single inoculation, eliminate the late severe reaction but do not influence the early and innocuous weal. The protection afforded may last for several years. *C. W.*

Earle (K. Vigors). **Pathological Effects of Two West Indian Echinoderms.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Jan. 28. Vol. 33. No. 4. pp. 447–452. With 2 figs. [12 refs.]

The author describes the effects of penetration of the spines of two varieties of sea-urchin, the white and the black, and of ingestion of the eggs of the former.

The white sea-urchin, the edible sea-egg of the West Indies, *Tripneustes esculentus*, has a size up to 14 by 9·5 cm., and is covered with short, sharp, slender spines. Inside the shell lie the eggs, which are eaten either raw or boiled and fried. Penetration of the spines, though these are not poisonous, usually leads to suppuration, calling for removal by the knife. The eggs are in season from September to April and in susceptible persons the eating of them may be followed by abdominal symptoms—epigastric pain, nausea, vomiting and diarrhoea. Such persons may show idiosyncrasy to other shell-fish. Of course, incidental infection by bacteria or their products may arise.

The black sea-urchin, the "cobbler" of Barbados, *Centrechinus antillarum*, is found on the sea-bed and also adhering to rocks, piers, breakwaters, etc. Its size is 10 by 6 cm., with long spines, 30–40 cm. These are sharp and have small barbs along their whole length directed towards the point, and hence they should be easy to remove, but the spines are very brittle and any attempt at removal usually results in their breaking off in the wound. From the spines there exudes a reddish fluid which acts as a powerful irritant and causes intense pain if the spines break. Suppuration is rare and as a rule the foreign body is removed by clasmatocytes within 48 hours, and merely a local dressing is needed. If the sole of the foot is wounded, the administration of a prophylactic dose of antitetanus serum is advisable.

H. H. S.

STILL (R. M. Lloyd). **Remarks on the Aetiology and Symptoms of Young-Dah-Hte with a Report on Four Cases and its Medico-Legal Significance.**—*Indian Med. Gaz.* 1940. Feb. Vol. 75. No. 2. pp. 88–91.

The literal translation of *young-dah-hte* is "to be ticklish and nervous." The author speaks of two types. In one, the individual reacts to sudden stimuli by imitating words or gestures of those about him; in the other, a sudden touch or auditory stimulus causes a jumping or recoil as though the subject was severely frightened. In either form he may utter some obscene epithet. The first type seems to be nearly related to *latah* and the second to the convulsive tics (*cf.* Gilles de la Tourette's disease). Mongolian races seem to be particularly predisposed, but heredity does not seem to play any part. The more immediate cause is shock, or worry, or observation of, or contact with one so affected. Mentally, they are as alert as their fellows, and beyond hyperaesthesia and exaggerated reflexes, show no abnormal physical signs.

Four cases are detailed, three of type one and one of type two. The first, a Burmese woman of 33 years, showed a condition rather closely allied to *amok* and had murdered her husband, apparently without motive. When tested she was markedly imitative (*latah*), would repeat a question if asked in a loud tone, but would answer rationally if addressed quietly [this is noted in young-dah-hte]. The second was a Burman of 60 years, who, when he was brought a block of wood for a pillow by a stranger in a rest house and the stranger inadvertently dropped it, picked up the block and hurled it at the man and killed him. He too was found to be "imitative" and had been so for 7 or 8 years; for example, on watching a man swimming he fell on the ground and made swimming movements on land. This patient, was, however, found to be suffering from cerebral syphilis. Of the other

two, one was markedly imitative, repeated questions and shouted and responded to sudden stimulus with abuse or an epithet. The other typically responded with a jump and appearance of fright if touched, tickled or shouted at.

The author compares the condition described with allied complaints such as *latah, amok, banga, schamanismus* and *nat-win-de*. It differs from *latah* in that in *latah* the patient remains in the imitative condition as long as the examiner chooses, once the patient is thrown into this state, but in *young-dah-hte* the patient is always in this state and liable to react. *Amok* is a psychical disturbance in which there is a violent attempt to kill, after which there is a stuporous condition and perhaps amnesia. *Banga* is described as a hysterical condition among women in the Congo about the time of puberty. The subject may be convulsed, or rushes into the open country or jungle uttering wild cries. *Schamanismus* is a condition of religious eroticism resembling the old dancing mania. Lastly, *nat-win-de* is also a sort of religious dance, with swaying movements and closed eyes, started by a professional and taken up by others. The performers are said to have no recollection afterwards of what they have done. *H. H. S.*

Reid (J. D.), Scherer (J. H.) & Irving (H.). **Systematic Histoplasmosis in the United States.**—*Science.* 1940. Mar. 15. Vol. 91. No. 2359. p. 264.

The authors say they have had the opportunity of studying a case of histoplasmosis in a coloured male adult in St. Philip's Hospital, Richmond, U.S.A. and express it as their opinion that such cases must be more common than the published reports would lead one to suspect. It is suggested that a finding of anaemia with leucopenia in a weakened, emaciated subject running a septic temperature should lead to search of the blood for infected monocytes or examination of material obtained by puncture of the sternum, as the parasites occur in enormous numbers in the marrow. *C. M. Wenyon.*

Clemens (Harry H.) & Barnes (M. L.). **Histoplasmosis of Darling. Report of a Case.**—*Southern Med. Jl.* 1940. Jan. Vol. 33. No. 1. pp. 11–15. With 8 figs. [27 refs.]

The case described is that of a 33-year-old negress in Kentucky who died of a generalized *Histoplasma capsulatum* infection. The organism was isolated in culture from the blood 26 days before death. The post mortem appearances are described and a series of microphotographs illustrate the pathological changes. *C. M. W.*

Reyer (Wilhelm). Infektionsversuche mit Blastozystis. [**Attempts at Infection with Blastocystis.**]—*Zent. f. Bakt.* I. Abt. Orig. 1939. Oct. 9. Vol. 144. No. 7–8. pp. 421–425.

The author shows that the human blastocystis will not infect dogs or rats, while the naturally occurring rat blastocystis cannot infect mice. Rats are readily infectible with blastocystis from rats. These experiments seem to prove that the contention of Alexeieff that all blastocystis belong to the one species *Blastocystis enterocola* is incorrect. When the blastocystis is cultivated it changes its morphology and at the same time loses its capacity for infecting the natural host. *C. M. W.*

PEREIRA (Jayme). Das Vanadium bei der Behandlung der menschlichen Protozoenerkrankungen. [**Vanadium in the Treatment of Human Protozoal Diseases.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1939. Nov. 17. Vol. 97. No. 1. pp. 77–81. [13 refs.]

The author, working in Brazil, has found that vanadium, under the proprietary name of Tarvan, is an exceedingly active remedy for syphilis in both children and adults, as has been widely held by other workers. It has an equally marked action on yaws, while good results follow its use in chronic spirochaetal ulcers of the skin, noma and mucocutaneous leishmaniasis. *C. M. W.*

KHARTOUM. **The Kitchener School of Medicine. Sixth Report 1936–1938.**—76 pp. With 4 plates. [No date or place of publication.]

This comprehensive report should be read by all who are connected with medical education in Africa. During the period 1924 to 1938, 116 students were enrolled and 68 have already graduated, and those selected to fill senior posts are sent to London for post-graduate study. Reports are given for 1936, 1937 and 1938, and to each is appended the Assessors' Reports for the year. The terms in which such authorities as J. S. FAIRBAIRN, H. Letheby TIDY, Professor (now Sir) W. W. JAMESON and Sir A. E. WEBB-JOHNSON write of their experiences in conducting the final examinations and in the observation of the graduates at work in their stations is profoundly encouraging.

The second half of the Report consists of a detailed statement of the curriculum, which now occupies six years, the first two of which are spent at the school of science. There can be no doubt that it covers completely the necessary ground and that the level of knowledge gained approaches within measurable distance of that taught in medical schools in Britain. *C. W.*

HONG KONG. **Report of the Technical Committee for the Reorganization and Improvement of Existing Official Hospital and Clinical Facilities of the Colony of Hong Kong, 1938–1939** [Chairman: Dr. P. S. SELWYN-CLARKE, Director of Medical Services].—92 pp. With a separate Supplement of photographs & line drawings relating to Appendices D, G, H, J & K. Hong Kong: Noronha & Co., Ltd., Govt. Printers & Publishers.

In May, 1938, a Technical Committee was appointed in Hong Kong to enquire into the existing hospital accommodation and to make recommendations for its reorganization and improvement. The report of the Committee has been published in two parts. The second contains photographs of the conditions as they existed and line drawings of proposed hospital, laboratories, health centre, etc.

Although the standards determined for one Colony may not be applicable to another, where the density of population, the class and character of the people, the climate and prevalent diseases are different, nevertheless it is thought that the findings and recommendations of the Committee will be of interest outside the actual Colony dealt with and are therefore referred to here.

The recommendations are based upon a population of 1¼ millions during the next five years. The Committee conclude that there is

a large deficiency of hospital accommodation for the Chinese population, more than 3,000 being needed to remedy this deficiency in "general" beds and nearly a thousand for infective cases. Tuberculosis is a very important cause of ill-health and special provision should be made for dealing with this by the use of pavilions, whereby heliotherapy can be applied, and the setting aside of special wards for treatment of the more infective. With only 300 beds for sick children, there is need for another 325 on a basis of one for every 2,000 persons. Another 200 or more are needed for maternity cases because the birth-rate is high and overcrowding makes home confinement difficult and impracticable, particularly in view of the insanitary surroundings of many of the homes. As regards leprosy patients, a small "collecting station for lepers" exists, but the decision of 1938 not to build a leper settlement is confirmed. There are large numbers of lepers in South China who would enter these territories if such a settlement were established. Under present conditions lepers are transferred to mission settlements in Kwangtung subsidized by the British Government. There is need for improvement and extension of laboratory services and some re-arrangement to avoid overlapping of the work of the Government Bacteriological Institute and the Pathological Department of the Victoria University. Erection of another laboratory at the Kowloon Medical Centre is advised and also a biological products laboratory on the outskirts of Kowloon. It is suggested that much, perhaps most of the "diagnostic and investigational work" at present carried out at the Bacteriological Institute should be undertaken by the University Authorities in return for a subsidy. The foregoing are the main changes and modifications suggested. *H. H. S.*

REVIEWS AND NOTICES.

CROWN AGENTS FOR THE COLONIES. **Hints on the Preservation of Health in Tropical Africa.**—59 pp. With 6 plates. 1938. London: 4 Millbank, S.W.1. [1*s.* 6*d.*]

This booklet is intended primarily for non-medical Government Servants in tropical Africa, but as it is the kind of publication to which medical officers may refer when asked to recommend a short book containing information set out clearly for lay readers, and as it is on sale to the general public, it is hoped that a notice in this *Bulletin* may bring it to the attention of those who have not had the opportunity of reading it.

The first section deals with general considerations of living—food, water, the use of alcohol, exercise, rest, personal cleanliness and vaccination against certain diseases. The second section is a statement, in the most general terms, of the principles of infection with, and of prevention of, communicable disease. The third section is a brief description of diseases referred to as the blood inoculation group: malaria and blackwater fever, yellow fever, dengue, tick fever, plague, sleeping sickness and tropical (tick-borne) typhus. Emphasis is laid on methods of prevention. The fourth section deals with the intestinal and excremental group of diseases: diarrhoea, enteric fevers, undulant

fever, dysentery and diseases due to parasitic worms. The fifth section contains information on skin conditions, wounds, insect bites, myiasis, venereal disease and smallpox. The sixth section is concerned with alcoholism, effects of the sun, dental disease and snake bite.

In the succeeding section are given the fundamental facts on the identification of the genera of mosquitoes, and on prevention of breeding, on flies, and on disposal of refuse, excreta and waste water, and finally there is a list of medical stores necessary for personal use, and instructions on the taking of blood films.

The book is illustrated. It is direct and practical and will undoubtedly be valuable to lay readers. It was written by the late Dr. A. J. R. O'Brien, when he was Chief Medical Adviser to the Secretary of State for the Colonies. *C. W.*

Blacklock (D. B.) [M.D. (Edin.) D.P.H. (London), D.T.M. (Liver.), etc.] & Southwell (T.) [D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.E., etc.]. **A Guide to Human Parasitology for Medical Practitioners.** Fourth Edition.—pp. viii+259. With 2 coloured plates and 122 text figs. 1940. London: H. K. Lewis & Co., Ltd. [12*s*. 6*d*.]

The fact that this small handbook has passed through four editions within a period of ten years is sufficient testimony of its value. Apart from slight modifications in the description of the life-history of *Strongyloides stercoralis* and one or two other minor matters necessitated by recent advances in knowledge, the present edition is unchanged.

W. Yorke.

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